

PLANNING FOR A HEALTHY FUTURE

TOWARDS A FRAMEWORK FOR STRATEGIC PERSONNEL PLANNING IN A HEALTHCARE ORGANIZATION



UNIVERSITY OF TWENTE.
Medisch Spectrum Δ Twente

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November, 2012

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MASTER THESIS

November, 2012

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MANAGEMENT SUMMARY

Introduction

In the upcoming years, the healthcare sector and its labour market are expected to change. The main causes for this include demographic changes of the population and the workforce of an organization, new laws and regulations, technological developments, and the current economic climate. The most disconcerting are demographic factors: the greying and dejuvenation of the population and the workforce are expected to cause a shortage on the labour market while simultaneously causing an increase in the demand for qualified healthcare personnel. It is important for an organization to timely react to internal and external pressures to ensure there will be a sufficient quantity and quality of personnel in the future to meet the changing healthcare demands and objectives of the organization. Strategic personnel planning (SPP) can help signal and control these issues enabling an organization to anticipate and react timely to changes in the organization's environment and workforce by means of human resource (HR) policies.

In the current study SPP has been defined as the process of determining the quantity and quality of the future personnel required and the future personnel available in order to timely signal any differences between the supply and demand in the future, allowing an organization to implement HR policies with regard to the inflow, through flow, and outflow of personnel in order to effectively and efficiently allocate the workforce to meet the strategic objectives of the organization and cope with environmental contingencies and pressures. The starting point of the SPP process consists of portraying the current labour force. Part of the future workforce is currently employed. Therefore, in order to determine the supply of personnel in the future, the current labour force forms the starting point. After portraying the current workforce and the mutations that can be expected therein, a prognosis can be made regarding the future workforce. The demand for personnel in the future can be derived from changes in the external environment and the organization's corporate strategy. After describing these internal and external influential factors, a prognosis can be made regarding the workforce required in the future to meet the changing internal and external environment. By comparing the estimated future supply of personnel with the estimated demand for personnel in the future, discrepancies appear based on which HR policies with regard to, for example, recruitment and internal mobility can be implemented to overcome the gap.

Research Purpose

The purpose of the current research is to provide Medisch Spectrum Twente (MST) with knowledge and information regarding SPP; develop a SPP framework tailored to the current setting, the needs, and requirements of MST; and offer advice regarding the implementation of the framework. The final product of this research consists of a complete SPP framework comprised of different instruments to portray the current workforce; estimate the quantity and quality of the personnel available in the future; make a prognosis of the personnel required in the future to cope with external pressures and meet the strategic objectives of the organization; and determine the fit between the supply of and demand for personnel in the future. After completing these steps, the organization can decide which actions need to be taken to overcome any discrepancies between the supply of and demand for personnel in the future. Although the actual implementation of strategic personnel planning within

MST falls outside the scope of the current research, recommendations have been provided regarding the implementation of the SPP framework. In addition, the study aims to create awareness about the problem and the need for SPP, and create support for the SPP framework among team leaders and managers of MST. This is to form a positive environment for the actual implementation of the SPP framework and its instruments.

There are many different methods and instruments to measure and portray each of the steps of the SPP framework. The main objective was to identify the instruments that are most suitable for MST, meaning that the instruments and the complete SPP framework had to be simple, straightforward, and practical in use.

Methodology

In order to determine which instruments should be included in the SPP framework for MST, first the theoretical background has been created to provide an overview of the different instruments that have been developed over the years. From this collection of instruments found in the literature, a preliminary selection has been made. This selection was made by taking into account the advantages and disadvantages of the instruments combined with a contingency approach suggesting that the type of instruments suitable for an organization's strategic personnel planning is contingent upon the labour market structure, the organization's configuration, and the type of mobility within the organization.

Since the preliminary selection was based solely on a literature study, it was important to determine whether the selected instruments were useful and applicable within the current setting of MST. From the preliminary SPP framework the instruments and the overall framework have been assessed, tested, and evaluated to create the final SPP framework tailored to the current needs and requirements of MST. Here, a case study strategy was used focussing on a single case: Medisch Spectrum Twente. The process of collecting data consisted of two parts: qualitative interviews and a pilot implementation. First, 13 qualitative interviews with end-users of the framework have been conducted to gather in-depth knowledge regarding the end-users' requirements concerning the instruments and the SPP system as a whole. In addition, interviews with HR employees of two other hospitals have been held to gain knowledge and advice concerning the use of the different instruments and the implementation thereof. Based on the findings of these data collection procedures, several adjustments and alterations have been made to the preliminary SPP framework, resulting in the development of the refined SPP framework for MST. Next, the instruments of the refined framework were put into action to test the practicality, feasibility, and user-friendliness of the instruments. During this small scale pilot implementation two team leaders, assisted by a business manager and an HR advisor, used the instruments to portray the quality of the current workforce and the instruments to determine the demand for personnel in the future. The necessary calculations were performed by the researcher. The focus of the pilot implementation lay not upon the actual outcomes of the SPP framework. Rather, the pilot implementation was meant to test the usability and practicality of the instruments. To measure this, a group interview was conducted during which all participants of the pilot implementation shared their opinions and experiences in working with the instruments. The results of the group interview lead to the final changes and alterations to the SPP framework.

Findings

The findings of the interviews with stakeholders showed that although most respondents were not familiar with strategic personnel planning, they do see a need for it and would like to see it implemented within MST. During the pilot implementation, it became clear that team leaders cannot perform all necessary steps of the SPP process individually. Therefore, it is important that the SPP process is a group effort: especially concerning the estimations made regarding the demand for personnel. Thus, although the individual team leaders are responsible for using several of the instruments individually, a group meeting with all team leaders within a division should be held, guided by the business manager and the HR advisor of that division, in which the external environment is analyzed and the strategic objectives are discussed. Furthermore, even though several of the SPP instruments can be completed by the team leaders individually, the business manager and the HR advisor should guide the process and assist where necessary.

The SPP Framework for MST

The final SPP framework that has been created for MST consists of a number of individual instruments. These instruments will be described briefly in the following paragraphs.

Current Workforce

To portray the current workforce, the personnel information system Beaufort is used together with the Human Resource Performance Potential Portfolio (HR3P-) matrix. From Beaufort, the HR advisor of a division gathers quantitative information for each individual employee within a department. The necessary data includes: date of birth; type of contract (permanent or temporary); end-date of contract (if applicable); the fulltime equivalent (FTE); and the function. In addition, data concerning outflow in the previous years is collected.

Next, each team leader completes the HR3P-matrix for each function category within his/her department. The HR3P-matrix is a performance management tool in the form of a matrix used to portray the quality of the current workforce in terms of the employee's current performance and growth potential. The current performance is assessed based on criteria specified in the employee's job description. The completed HR3P-matrix provides an overview of the distribution of the workforce in terms of quality.

Supply Prognosis

The current workforce forms the starting point for determining the personnel available in the future (i.e. in three years). Based on the data obtained from Beaufort, the HR advisor can make estimations regarding the outflow that is likely to occur over the next three years. First, the natural-outflow (i.e. outflow caused by retirement and temporary contracts) is determined. Next the other-outflow-percentage is calculated based on trends of the past year(s). By combining the natural-outflow prognosis with the other-outflow-percentage an estimation of the quantity of outflow per function category can be made.

Next, the each team leader completes the performance and potential (P&P) matrix. This matrix takes the HR3P-matrix as a starting point and transforms the sixteen cells of the HR3P-matrix into four cells. The P&P matrix is then compared to the outflow prognosis to determine the quality of the personnel that flows out and, ultimately, the quality that remains within the department.

External Environment & Corporate Strategy

The demand for personnel in the future can be determined based on changes in the external environment and the strategic objectives of the organization and the individual departments. Therefore, first a PEST analysis is conducted to portray the external environment in terms of political, economic, socio-cultural, and technological factors. This analysis can be performed during a meeting or workshop session with all team leaders of a division, supervised by the business manager. During this meeting, all external factors that can affect the demand for personnel are listed and discussed. From the PEST analysis, each team leader creates the EFE matrix for his/her department, including only those factors that are relevant for the department. The EFE matrix is a tool to determine the importance and influence of each factor on the department's workforce and the extent to which the current workforce of the department is expected to cope with the factors.

In addition to external factors, the demand for personnel is influenced by the corporate strategy. The corporate strategy forms the basis from which the strategic objectives of the division are set. During a meeting similar to the meeting discussed above, the team leaders, business manager, and the HR advisor of the division specify and summarize the strategic objectives of the division. Ideally, this process can be coupled with the creation of the annual plans. After jointly determining the strategic objectives of the division, each team leader, assisted by the business manager and the HR advisor, summarizes the strategic objectives for his/her department. The strategic objectives can be summarized in the strategic objectives table where special attention is paid to the effect of the objectives on the workforce of the department.

Demand Prognosis

The before mentioned instruments that are used to analyze the influence of the external environment and the strategic objectives on the department's workforce aim to give direction to the decision making process by highlighting focus points and problem areas, based on which a prognosis of the demand for personnel in the future can be made. The occupation table is used to portray the demand for personnel per department in FTE per function category.

Fit between Supply and Demand

After determining the demand for and supply of personnel in the future, the two are compared by means of the fit table. The fit table presents a numerical overview of the complete SPP process and provides the final outcome.

Actions

Any discrepancies that appear in the fit table can be overcome by means of (HR) actions. First, the outcome of all departments within MST is combined in order to compare the outcomes and determine whether there are opportunities regarding internal flow. Next, the HR3P-matrix can be used to determine which employees might be suitable to be transferred to another function if necessary. In addition, alternative actions such as HR policies regarding inflow, internal flow, and outflow, might be necessary to create the workforce required in the future.

Recommendations for Implementing the SPP Framework

Although the actual implementation of the SPP framework within MST falls outside the scope of the current research, the following recommendations can be suggested regarding the implementation of the framework:

General remarks

- Central coordination, decentralized planning;
- Divide the workforce into categories based on functions;
- Use a planning horizon of 3 years;
- Perform the complete SPP process once a year, preferably combined with the process of developing the annual plans of the departments;
- Review the SPP process and the individual instruments after the implementation and alter the system if necessary.

Prior to implementing the SPP framework

- Develop workable software to make the process of collecting data and performing the necessary calculations more efficient;
- Update Beaufort to ensure the input for the SPP process is accurate;
- Restructure the job matrix;
- Develop and communicate the corporate strategy;
- Train and educate the people involved in the SPP process;
- Perform a second pilot implementation to test the SPP system after making the adjustments described in the previous points.

Implementing the SPP framework

- HR policy department starts the process by distributing all necessary information (i.e. instruments, manuals);
- HR advisor, business manager, and team leaders collaborate on measuring in portraying the current workforce and making a prognosis for the supply of and demand for personnel in the future;
- Communicate all findings with the people involved.
- HR policy department concludes the process by determining what actions need to be taken to overcome any discrepancies between the supply of and demand for personnel in the future.

Benefits of Strategic Personnel Planning

The core value of strategic personnel planning and the instruments described above is that it provides the possibility to determine the need for and availability of personnel in the future, thereby allowing an organization to timely signal any discrepancies and take the necessary actions to meet the changing demands and the objectives of the organization. There are some additional benefits of the SPP framework and its instruments that are worth mentioning. In the beginning of this research, SPP has been described as a means to cope with scarcity on the labour market. However, SPP can also be a valuable tool in times of reorganizations or organizational changes that impact the workforce of an organization. In addition, portraying the quantity and quality of the current workforce alone can serve as an eye-opener by highlighting focus areas and bottlenecks. SPP can also

help with the relocation of employees and provides insights regarding internal mobility possibilities. Finally, the individual instruments can be used for other purposes apart from strategic personnel planning. For example, the HR3P-matrix can be used for performance appraisal and the EFE matrix can be used to provide an overview of the different external forces influencing the organization, which can be beneficial in creating the annual plans for the department.

Future Recommendations for MST

The SPP framework developed in this study is meant to be suitable within the current settings of MST. As a result, certain instruments have been altered to fit the situation at hand. To increase the effectiveness and success of the SPP process in the future, it is recommended to (a) monitor and register internal flow so it can be used to estimate the supply of personnel more accurately; (b) determine whether a relationship exists between the age of employees and their FTE to incorporate this pattern into predicting the personnel available in the future; (c) closely monitor the external labour market on a regular basis to include changes therein into the process of determining which actions to take to overcome any discrepancies between the supply of and demand for personnel in the future; and (d) test whether the SPP framework is suitable to be implemented by staff departments.

Relevance of the Research

Since the purpose of the current study was to develop a SPP framework tailored towards the needs and requirements of one organization, Medisch Spectrum Twente, it is uncertain whether the outcome is relevant for other organizations besides MST. In general, the instruments used are not firm specific, or explicitly focussed on the health care sector, meaning that it can be possible for another organization to use the instruments. However, should another organization wish to use the SPP framework or individual instruments, it must be determined whether the instruments are in fact suitable for that specific situation or whether different instruments provide more accurate outcomes. The theoretical relevance of the current study lies in the fact that instruments developed in previous research have been used as a starting point from which they have been adjusted to fit MST. By altering existing instruments, creating additional instruments, and suggesting specific combination of instruments to form a strategic personnel planning framework, the current study contributes to the existing body of knowledge regarding SPP. In addition, this research provides recommendations regarding the implementation of the SPP framework, which is relevant for researchers as well as practitioners.

ACKNOWLEDGMENTS

My interest in human resource management was first triggered during my bachelor studies in International Business and Management. The emphasis of this study was placed upon international marketing, sales, and strategic issues; focussing on products, services, and profit. During the third year of my bachelor studies I followed the course 'Human Resource Management' (HRM). Although this course was mainly an introduction to HRM, I learned that a good marketing or sales strategy alone is not sufficient: employees contribute to the achievement of organization's strategic objectives, making human resources and good personnel management highly important for an organization to succeed. Therefore, I decided to extend my knowledge regarding human resource management and started with the master Business Administration, with a specialization in HRM. This dissertation marks the end of my study at the University of Twente.

This dissertation on the topic of strategic personnel planning allowed me to combine knowledge gained during my bachelor studies with knowledge and skills obtained through the master program. I specifically chose to do research within an organization since I prefer to conduct a practice oriented research. Medisch Spectrum Twente offered me the opportunity to do my graduation project there, for which am I very thankful.

The last nine months have been interesting, challenging, and above all a great learning experience. There are many people that have made a significant contribution to this research. First of all, I would like to thank MST for offering me the opportunity to conduct my thesis on such an interesting topic. I especially want to thank Tim Nijenhuis, who supervised this project on behalf of MST, for the valuable advice and support he gave me during the project. I would also like to thank Annelies Leussink for her guidance and suggestions. Besides, my gratitude goes out to the HRM department of MST for creating a pleasant work environment and making me feel as part of the team. My appreciation also goes out to the employees who participated in the study for providing me with qualitative information and valuable contributions to this research.

Furthermore, I want to thank Jan Kees Looise for supervising this project on behalf of the University of Twente. He has offered me valuable insights and advice, and encouraged me to get the best out of myself. I would also like to thank Ida Wognum for providing me with helpful feedback during the final stages of the project. Finally, my gratitude goes out to Michiel Mulder and all my family and friends who encouraged and motivated me during the past two years of my master studies. Special thanks go out to my dad who taught me I could do anything if I put my mind to it.

Enschede, November 2012

Marloes van der Worp

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1. INTRODUCTION

Strategic personnel planning (SPP) is a popular term in organizations nowadays (Arbeidsmarkt Zorg en Welzijn [AZW], 2011; Van der Windt, Smeets, & Arnold, 2009; Zorginnovatieplatform [ZIP], 2009). Personnel planning, or manpower planning, has gained much attention during the 1960s and 1990s (Evers & Verhoeven, 1999), but this interest has decreased over the past decade. However, due to expected shortage on the labour market the topic is gaining popularity again.

This research is performed for Medisch Spectrum Twente (MST), one of the largest non-academic hospitals in the Netherlands. In the healthcare sector, the shortage on the labour market is mainly due to the greying and dejuvenation of the population, causing the supply of personnel to decrease (Garssen, 2011; Van Duin & Garssen, 2010). On the other hand, the greying of the population is likely to cause an increase in the demand for qualified healthcare personnel (AZW, 2011; NVZ Vereniging van Ziekenhuizen [NVZ], 2009; ZIP, 2009). Internal and external pressures including the changing labour market and population demographics make it important for MST to timely react to ensure there will be a sufficient number of qualified personnel in the future to meet the changing healthcare demands and the objectives of the organization. Therefore, this research aims to design a strategic personnel planning framework for MST and offer advice with regard to the implementation of SPP.

The following starts by providing a brief introduction to the organization MST, the labour market and external environment, and strategic personnel planning to give an impression of the research setting. Next, the problem is defined along with the objectives of the research and the research questions. Finally, the research design is described which provides the basis for the current research.

1.1 Company Profile

Medisch Spectrum Twente is one of the largest non-academic hospitals in the Netherlands. The organization employs roughly 4,000 employees, of whom 250 medical specialists, and has locations in Enschede and Oldenzaal as well as polyclinics in Haaksbergen and Losser. MST is a medical-specialized hospital aimed at improving the health of the residents of the region Twente by offering specialized care. Besides basic care, MST offers top clinical care that requires specialized facilities and knowledge. Therefore, the hospital employs a great number of professionals with exceptional knowledge and skills, and has special facilities for diagnosis and treatment available. Almost all specialties are present in the hospital (Medisch Spectrum Twente, n.d.). Training, education, and research are important aspects of the top clinical profile. MST offers educational opportunities for nurses, resident physicians, paramedics and other professionals, and has its own educational institution called Medical School Twente. Medical School Twente facilitates, guides, and coordinates all education, internship, training, and research related activities. This enables MST to train and develop qualified personnel internally (Medical School Twente, n.d.).

In 2008, the organizational structure of MST has changed to a flat organizational structure with a smaller span of control and three hierarchical layers: the strategic level consisting of the Board of Directors; the tactical level including business managers and medical managers; and the operational level made up of team leaders. In addition, result oriented units (RVE) have been formed which each

have their own budget and are responsible for their own results. There are currently seven divisions, each consisting of different RVE, which, in turn, consist of several departments. The departments are directed by team leaders responsible for managing one or more departments within an RVE. Each clinical division, consisting of several different clinical RVE, is managed by a business manager and a medical manager; each non-clinical division is managed by either a business manager or a staff manager. The non-clinical supporting divisions consist of the staff services, of which the staff service Human Resource Management is one. Each staff service supports the primary units in their areas of expertise. The full organization chart of MST can be found in Appendix A.

1.2 External Environment

The healthcare sector and its labour market are expected to change in the upcoming years due to demographic changes of the population and the workforce, new laws and regulations, increasing competition, technological developments, and the economic climate. According to De Galan and Van Miltenburg (as cited in Evers & Verhoeven, 1999), changes in the external environment are important determinants for the demand for personnel in the future. In order to provide an overview of the research setting, the external factors influencing the labour market will be portrayed by means of a STEP analysis, also known as a PEST analysis. A STEP analysis describes the external environment of an organization in terms of the sociocultural, technological, economic, and political factors and can be used to describe the influence of the external factors on the labour market of the healthcare sector. Here, the order of STEP is used since sociocultural factors are important in the labour market and influence the other factors; therefore sociocultural factors are described first.

1.2.1 Sociocultural Factors

The Dutch population is scarcely growing, although the composition of the population is changing (Blank & Wats, 2009). It is estimated that, in the upcoming years, there will be a rapid growth in the number of people older than the age of 65 (Garssen, 2011; Van Duin & Garssen, 2010). This growth is mainly due to the fact that the Babyboomers, those born after World War II, will turn 65 in the following years. The number of people in the Netherlands older than 65 is expected to grow from 2.4 million in 2011 to 4.6 million in 2040 (Garssen, 2011). In the Netherlands, people generally retire at age 65 (although this is in the process of being changed, as described in Section 1.2.4) meaning that the before mentioned demographic trend will have a great impact on the labour market and current workforce of organizations.

In addition to the greying of the population, dejuvenation of the population will also affect the labour market. Between mid 1980 and early 1990, birth rates were relatively low. This can have an effect on the number of students enrolling in a health related education program (AZW, 2011). Over the past five years, the number of students who enrolled in a healthcare related MBO or HBO education program has increased. However, this number is expected to decrease slightly in the upcoming years due to dejuvenation of the population (AZW, 2011). In addition, a direct result of the dejuvenation of the population is that the number of young people (18-25 years of age) entering the labour market is expected to decrease compared to previous years (Van Duin & Garssen, 2010).

In the healthcare sector, the demographic changes of the labour market come down to a shortage in the labour force due to greying and dejuvenation of the population (Garssen, 2011; Van Duin & Garssen, 2010). Besides the decrease in supply of personnel, the greying population has another

impact on the healthcare sector: the demand for healthcare is likely to increase since older people in general need more health care compared to younger people. In addition, the number of different diseases increases, but also the knowledge regarding diseases and techniques used to treat them develop constantly, increasing the demand for qualified hospital personnel (AZW, 2011; Blank & Wats, 2009; NVZ, 2009; ZIP, 2009).

Another social trend that can be seen in the labour market is the individualization of the workforce, meaning that an increasing number of people are self-employed freelancers who can be hired by an organization (AZW, 2011). In times when the labour market is tight and the demand for personnel is high, these self-employed people gain negotiation power with regard to their salary and working conditions, putting the organization in a weak position (Pleijster & Van der Valk, 2007).

1.2.2 Technological Factors

Technological developments can influence the labour market in many ways (AZW, 2011). Besides the fact that technological advancements can have a positive effect on the quality of the care offered by the hospital, new treatment methods and technologies such as robots can increase the labour productivity (Blank & Wats, 2009), which can lead to a decrease in the demand for personnel. In addition, new technologies and treatment methods can change the demand for personnel in terms of qualification: better skilled employees might be needed to work with specialized technology; on the other hand, technological advancements can simplify certain tasks, making it possible for lower skilled employees to perform certain procedures (AZW, 2011). Thus, while technological advancements can increase productivity and therefore lead to a lower demand for personnel, it can also produce a shift in the demand for a specific type of personnel. However, the AZW (2011) estimates that the technological developments are more likely to increase the quality of healthcare and working conditions than to increase the labour productivity.

1.2.3 Economic Factors

The current economic climate causes the government to heavily cut back on all costs. Cost savings in certain areas of the healthcare sector result in changes in the demand for personnel. An increase in the demand for personnel in all sectors can have a strong result on the competition for personnel from different sectors. The AZW (2011) estimates that this competition will have a negative effect on the healthcare sector since the flow of people into the sector is likely to be lower than the number of people flowing out of the healthcare sector. In addition, the increasing competition is likely to lead to higher salaries, which, in turn, can lead to a decrease in the demand for personnel (AZW, 2011).

The changing population demographics, increasing welfare, and technological developments have resulted in an increase in healthcare costs over the past years (Schwenker & Bernardo, 2010). In order to save costs and increase the efficiency of the healthcare sector, the Dutch Ministry of Health, Welfare and Sport (VWS) established three main objectives for the sector: affordability, accessibility, and quality (Sauter, 2010). To reach these goals, the government is liberalizing the healthcare market, meaning that supply and demand creates a balance and structure the market, allowing healthcare organizations to compete with each other on quality and price (Schwenker & Bernardo, 2010). In the past, hospitals were funded via budgets based on the capacity of the hospital. In order to create the new market structure, most of these budgets will disappear and hospitals will be

funded based on their performance rather than their capacity (Nederlandse Zorgautoriteit [NZA], 2011). As a result, hospitals strive to increase specialization and professionalism to increase the quality of the services offered and obtain a competitive advantage. This is likely to lead to an increase in demand for higher qualified hospital personnel (AZW, 2011).

1.2.4 Political Factors

Recent changes in laws and regulations in the Netherlands can have an impact on the labour market in the healthcare sector (AZW, 2011; Blank & Wats, 2009). In the 2010 coalition agreement (VVD-CDA, 2010) as well as the 2012 coalition agreement (VVD-PvdA, 2012), certain aspects with regard to the healthcare sector are discussed. For example, the Dutch government strives to stimulate better basic care closer to people's homes, meaning that all healthcare providers, from specialized hospitals to general practitioners, can practice their area of expertise. This can, for example, have as a result that people visit their general practitioner for basic care rather than turning to a hospital. This can lead to a decrease in demand for hospital personnel.

In addition, the Dutch government aims to increase the quality of rare, complicated, and highly specialized treatments by concentrating these treatments to a limited group of hospitals (VVD-CDA, 2010; VVD-PvdA, 2012). As a result, hospitals shift their focus towards certain services and treatments, resulting in a shift with regard to the demand for personnel.

Another governmental policy regards the retirement age. Generally, people in the Netherlands retire at age 65. However, the government proposes that the retirement age is to be increased to 66 years in 2018 and to 67 years in 2021 (VVD-PvdA, 2012). These regulations are aimed at overcoming the labour market scarcity and increasing costs caused by the ageing workforce (VVD-CDA, 2010; ZIP, 2009). Ultimately, increasing the retirement age leads to an increase in the supply of personnel since employees can continue to work for a longer period of time (AZW, 2011).

The 2012 coalition agreement (VVD-PvdA, 2012) describes multiple changes to the healthcare sector, but also to the health insurance system of the Netherlands. Although the exact changes are uncertain at the moment, it is likely that it will have a great impact on the healthcare sector and the demand for personnel.

1.2.5 Conclusion

The external factors described in the previous sections can affect the internal and external labour market of the healthcare sector in different ways. Certain factors have a positive effect on the supply of personnel, for example the governmental policy with regard to increasing the retirement age, and better working conditions due to technological developments. Other factors, such as liberalization of the sector and an increasing productivity due to technological developments, can decrease the demand for personnel. There are also factors that can produce a shift in the demand for personnel, for example in terms of qualification due to changing technologies, new market structures, and new treatments; or a shift in terms of geographic regions, for example caused by the governmental policy that concentrates specialized treatments to a limited group of hospitals.

The most disconcerting are the sociocultural factors, including changing demographics of the labour market and the current workforce of an organization. Dejuvenation of the population, and the greying of the population and the workforce decrease the supply of personnel. Besides, the ageing population is likely to increase in the demand for personnel. It is essential for an organization to react timely to the changes in the internal and external labour market to ensure there will be a sufficient number of qualified personnel in the future. Strategic personnel planning is a tool that can help an organization signal and control these issues (Evers & Verhoeven, 1999; Van der Windt et al., 2009; ZIP, 2009).

1.3 Strategic Personnel Planning

Strategic personnel planning concerns the long-term planning of employees to enable an organization to determine who is needed in the future and to effectively and efficiently allocate the workforce to meet the strategic business objectives of the organization and deal with environmental contingencies (Evers & Verhoeven, 1999; Nkomo, 1988). It concerns translating the strategic plans of an organization into the area of human resources to adjust the quantity and quality of personnel based on the organization's strategic objectives and the human resource management policies (Evers & Verhoeven, 1999). Birch et al. (2009) describe the purpose of human resource planning in health care organizations as "ensuring that the right number and type of health human resources are available to deliver the right services to the right people at the right time" (p.856). Evers and Verhoeven (1999) mention that a SPP process consists of three elements: (1) estimating the supply of personnel; (2) predicting the demand for personnel; and (3) determining the fit between the supply and demand. By comparing the future supply of personnel with the future demand for personnel, a gap appears which can be overcome by means of human resource (HR) actions such as inflow, internal flow, and outflow policies.

1.4 Problem Definition

The problem Medisch Spectrum Twente has is that, due to the changing labour market, MST is uncertain whether there will be a sufficient number of qualified health care personnel in the future for the different departments within the hospital to meet the changing healthcare demands and the strategic objectives of the organization. In order to guarantee the continuity and quality of the services and care, the organization wishes to implement strategic personnel planning. MST requires insights on a regular basis into the dynamics of their current workforce as well as their future personnel requirements, based on which the HR policies and instruments can be selected and adjusted.

MST has not yet been able to construct or implement strategic personnel planning; the HR policies and instruments with regard to inflow, through flow and outflow aimed at solving future personnel problems have not been sufficiently applied. In the past, the need for personnel has been filled ad hoc via the external labour market and internal flow. However, changing workforce demographics, technological developments, and scarcity in a certain job category can make it difficult to meet the changing personnel demands in the future. Strategic personnel planning methods can help signal and control these issues (Evers & Verhoeven, 1999; Van der Windt et al., 2009; ZIP, 2009).

1.5 Research Aim

The purpose of the current research is to provide knowledge and information regarding strategic personnel planning, develop a SPP framework for Medisch Spectrum Twente, and offer the organization advice regarding the implementation of SPP. This to enable MST to anticipate and react timely to changes in the labour market and workforce by means of, for example, inflow, through flow, and outflow policies to ensure the right person is in the right place, at the right time.

The following paragraphs describe the specific objectives of the current research, the deliverables, and the factors critical for the success of the SPP framework to be developed.

1.5.1 Research Objectives

The objectives of this research are to:

1. identify the instruments that can best be used by MST to (a) estimate the supply of personnel in the future; (b) estimate the demand for personnel in the future; and (c) find the gap between the supply of and demand for personnel in the future;
2. explore stakeholders' views and requirements regarding the use of the selected instruments;
3. examine the usability of the instruments and the overall SPP framework;
4. formulate recommendations on how to implement the strategic personnel planning framework within the organization.

Although recommendations will be given, the actual implementation of SPP falls outside the scope of the current research.

1.5.2 Deliverables

The deliverables of this study consist of an overall framework for SPP, comprised of different instruments which allow MST to make prognoses regarding the supply of and demand for personnel in the future and identify the gap between the supply and demand of personnel. Based on this information, MST can adjust and implement the necessary HR policies to overcome the gap between supply and demand. As mentioned previously, although recommendations will be provided regarding the implementation of the SPP framework, the actual implementation falls beyond the scope of this research. However, throughout this research the final implementation is kept in mind since the foundations for the actual implementation are made throughout the creation process. This is described in more detail in Section 1.5.3.

The SPP framework to be developed in this study only considers long-term, strategic planning. Tactical planning, short-term planning, and time scheduling of employees within a department are not within the scope of the current study. However, it must be kept in mind that these are interrelated: strategic decisions ultimately affect the tactical as well as the operational planning.

1.5.3 Critical Success Factors

As mentioned previously, the actual implementation of the SPP framework and its instruments falls outside the scope of the current research. However, the ultimate goal for MST is to implement the SPP framework within the organization. Thus, the implementation of the framework must be kept in mind during the development phase. There are several factors critical for the success of the current

study, and, ultimately, for the success of the actual implementation of the SPP framework to be developed. These critical success factors include: (1) MST has to be aware of the problem and the need for SPP; (2) MST has to recognize the SPP framework as a solution to the problem; (3) the SPP framework and the instruments must be supported by all actors involved; (4) the instruments must be simple, straightforward, and practical to use; and (5) the SPP framework and its implementation must be feasible.

1.5.3.1 Awareness

First, an important aspect of the current study is to create awareness of the problem and the need for strategic personnel planning among team leaders, managers, and the HRM department. Currently, the problems that are likely to arise in the upcoming years do not yet have a noticeable impact. As a result, managers might not be aware of the possible future problems and might not see the need for a strategic personnel planning tool. Therefore, it is important to create this awareness and to make sure all parties involved are prepared to collaborate and understand the different aspects of the SPP framework along with its benefits. The description of external forces provided previously in this chapter is aimed to create awareness. In addition, awareness of the problem and the need and benefits of SPP is created by means of the interviews.

1.5.3.2 Recognisability

In addition to creating awareness, the SPP framework for MST has to be recognizable, meaning that the managers, team leaders, and HR personnel who will be involved in the implementation of the framework have to recognize the final solution (i.e. the SPP framework) as a real solution to the problem. Van Aken, Berends, and Van der Bij (2007) define recognisability as “the degree to which the principal client, the problem owner and other organization members, recognize research results in BPS [Business Problem Solving] projects” (p.166). The data collection methods used to develop the SPP system for MST are aimed at increasing the recognisability of the final framework among managers, team leaders, and HR personnel by including these people in the development of the SPP framework. Whether the SPP framework is recognizable can be determined after the (pilot) implementation and can be assessed based on the experiences of the people involved in the process.

1.5.3.3 Support

Next, it is important that all parties involved support the different instruments and are willing to use the instruments. If an instrument is complicated and highly time consuming to use, it is likely that team leaders or managers do not want to use the instruments or invest much time into providing input. This is an important aspect to consider in the development of the SPP framework.

In addition to using simple and practical instruments as part of the SPP framework (which will be described in more detail below), support from the actors involved can be stimulated by using instruments that can serve multiple purposes. For example, it would be beneficial if the instruments used for personnel planning can also be used for performance evaluation or general personnel administration.

As described previously, the data collection methods aim to increase awareness of the need for SPP and recognisability of the benefits of SPP among managers, team leaders and HR personnel. This awareness together with the recognisability can create support since it is likely that when people are

aware of a problem and recognize SPP as a solution to that problem, they will ultimately support the SPP system. Creating support among the members of the organization is highly valuable for the actual implementation of the system.

1.5.3.4 Simple, Straightforward, & Practical

Since team leaders of different departments will be responsible for working with most of the instruments, it is essential that these employees have the knowledge and skills necessary to understand and use the instruments. The team leaders of the departments often have different backgrounds in terms of education. Therefore, it is important to use SPP instruments that do not require extensive knowledge or specific skills. To stimulate the support and recognisability of all actors involved in the implementation, the SPP framework has to be uncomplicated, least time consuming as possible, and practical and straightforward to use. The pilot implementation performed in this study is aimed at determining whether the selected instruments are simple, straightforward, and practical to use.

1.5.3.5 Feasibility

Finally, the actual implementation has to be feasible within the settings of the organization. As previously mentioned, the organization can be divided into 7 divisions, which, in turn, can be divided into several RVE. Each RVE consists of a number of departments. Since there are close to 100 departments in total within MST, it is not feasible for the HRM staff alone to perform the necessary planning actions for each department. Therefore, the SPP framework to be developed in this study should be suitable to be implemented by each department of MST independently. The HRM policy department of MST offers the necessary tools and instruments with which the team leaders of the different departments, together with the business manager and the HR advisor, perform the actual planning processes by using the SPP instruments. In addition, it is important that the SPP system is feasible in terms of data available. Since information regarding the current workforce is required, this information must be available, accessible, and up to date.

1.6 Research Questions

Based on the problem definition and the research objectives described above, the central research question is formulated as follows:

Which instruments should be included in the strategic personnel planning framework for Medisch Spectrum Twente and how can the organization implement this framework?

To guide the research, three sub-questions have been formulated of which the answers will provide the input for answering the main research question:

1. What is strategic personnel planning and which instruments can be used for SPP?
2. Which SPP instruments are best suitable for MST?
3. How can SPP be implemented in the organization?

1.7 Research Design

The current research is practice-driven and can be regarded as a Business Problem Solving (BPS) project (Van Aken et al., 2007), aimed at improving the performance of a business process (i.e. personnel planning). Verschuren and Doorewaard (2010) state that the purpose of a practice-oriented research is “to provide knowledge and information that can contribute to a successful intervention in order to change an existing situation” (p.45). According to Van Aken et al. (2007), the regulative cycle of Van Strien (as cited in Van Aken et al., 2007) forms the basis of a BPS project. Verschuren and Doorewaard (2010) take a similar approach which they refer to as the intervention cycle. Both the regulative cycle and the intervention cycle consist of five phases: (1) the problem analysis phase; (2) diagnosis phase; (3) design or plan of action phase; (4) intervention/change phase; and (5) the evaluation phase. The purpose of the current research is to provide knowledge and information regarding strategic personnel planning, develop a SPP framework comprised of a set of instruments, and formulate recommendations with regard to the implementation of the SPP framework. Thus, the focus of this study is on the design phase of the intervention or regulative cycle. Therefore, this study can be regarded as a design-oriented project (Verschuren & Doorewaard, 2010). Although the foundation for the actual implementation is placed, as described in the Section 1.5.3, the actual implementation and evaluation of the SPP framework fall outside the scope of this research.

Although the main focus of the current study is on the design phase, the external environment is worth looking into to gain a better understanding of the problem and justify the need for strategic personnel planning. Therefore, this topic has been described in Chapter 1, together with an introduction to Medisch Spectrum Twente and SPP. After the research setting has been described, the SPP framework can be designed. The development of the SPP framework can be broken down into different steps, as displayed in the research framework below.

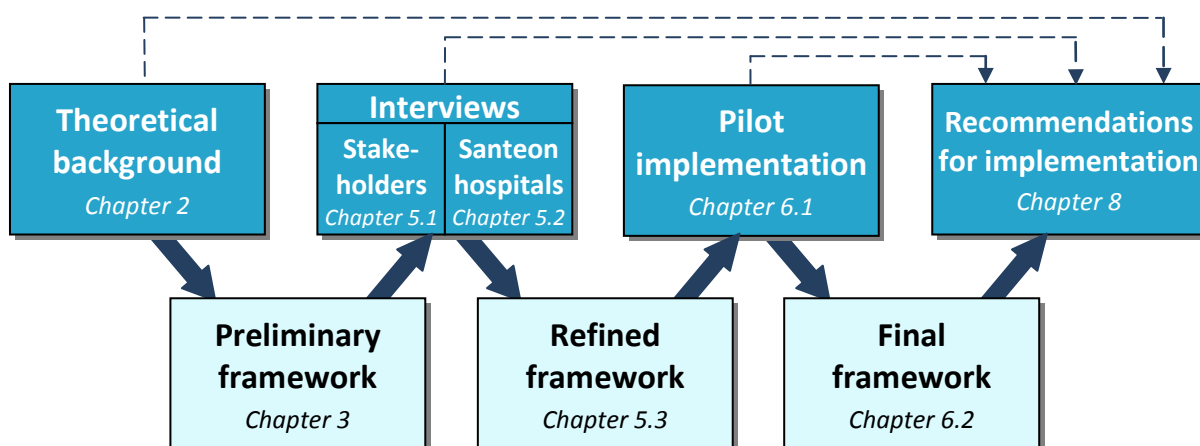


Figure 1 - Research Framework

First, the theoretical background is developed which discusses the different aspects of strategic personnel planning, and identifies different methods, models, and instruments that can be used for strategic personnel planning. The theoretical background can be found in Chapter 2 and answers sub-question 1. From the instruments identified in Chapter 2, an initial selection is made resulting in a preliminary SPP framework for MST, which is described in Chapter 3 together with a detailed description of the working methods of the selected instruments. Chapter 4 describes the research

methods that are used to test the framework. By means of interviews with end-users of the SPP instruments, and interviews with HR employees of other hospitals, the preliminary framework is refined. The findings of the interviews together with the refined SPP framework can be found in Chapter 5. Next, the refined SPP framework is tested by means of small scale pilot implementation, the results of which are discussed during a group interview. The findings of the group interview result in the development of the final SPP framework for MST, which is described in Chapter 6. The preliminary framework sketched in Chapter 3, combined with the findings of the interviews and the pilot implementation described in Chapter 5 and 6, form the answer to the second sub-question. To provide a clear overview of all instruments that are part of the final SPP framework, the complete SPP process and the instruments will be described by means of examples in Chapter 7.

As previously mentioned, the actual implementation of the SPP framework falls beyond the scope of this research. However, Chapter 8 will provide recommendations and suggestions with regard to the implementation of the SPP framework, thereby answering sub-question 3. As can be seen in the research framework (Figure 1), the theoretical background, the interviews, and the pilot implementation all provide input for the recommendations and suggestions to be made. By combining the answers to the three sub-questions, the central research question can be answered, which will be done in Chapter 8 together with an overall conclusion of the research. This report ends with a discussion of the overall research and the outcomes including limitations of the study and the relevance of the findings to researchers and practitioners. The discussion is presented in Chapter 9.

2. THEORETICAL BACKGROUND

The following provides the theoretical background regarding strategic personnel planning and the different instruments that have been developed over the years. The central purpose of this chapter is to provide knowledge and information regarding strategic personnel planning and the different instruments that can be used to portray, measure, and analyze the necessary data.

Section 2.1 starts by giving an introduction into the history of personnel planning, followed by a definition of SPP. In Chapter 2.2, different instruments that can be used to form a strategic personnel planning framework will be identified and described.

2.1 Strategic Personnel Planning

2.1.1 The History of Personnel Planning

Long-term personnel planning first gained interest in the late 1950s as a result of the shortage in the labour market. In order to cope with this shortage, strategic personnel planning methods were developed. Personnel planning consisted of mathematical instruments to forecast how many employees an organization needed in the future, which was relatively easy to predict (Evers & Verhoeven, 1999; Geurts, Evers, & Dekker, 1996). Price, Martel, and Lewis (1980) mention that the problem they most often came across during their literature study was the “planning and control of grade sizes” (p.639), referring to the problem organizations have in ensuring the right quality and quantity of manpower is available to meet the organization’s objectives.

Purkiss (1981) describes a quiet revolution that took place in manpower planning in the late 1970s, when personnel planning became more than scientific and mathematic approaches to “getting the right number of the right people in the right jobs in the right place at the right time” (p.315). The complex mathematical planning models developed in the 1960s were adjusted to a more problem-solving approach, making personnel planning an instrument where quantitative and rational decisions were combined with qualitative and emotional aspects (Evers & Verhoeven, 1999). The existing models were generalized and made available to practitioners in various organizations. In addition, alignment of the personnel policy with the objectives of the organization became important (Purkiss, 1981).

In times when the labour market is stable, the interest in long-term personnel planning generally decreases. Changes in the external environment of an organization as well as the labour market cause the interest in personnel planning to rise (Cappelli, 2009). Evers and Verhoeven (1999) describe the planning paradox: in times when the conditions are uncertain, the interest in personnel planning rises; however, the changing and uncertain conditions make the implementation of planning techniques more and more difficult. By means of formal (personnel) planning, organizations strive to cope with the increasing uncertainty (Jackson & Schuler, 1990).

2.1.2 Definitions of Strategic Personnel Planning

Different definitions of strategic personnel planning can be found in the literature. The definitions can roughly be grouped into 3 categories: definitions regarding the process of strategic personnel planning; definitions describing the purpose of SPP; and definitions focussing on the outcome of the SPP process.

Pynes and Lombardi (2011) define strategic personnel planning as “the process of analyzing and identifying the need for and availability of human resources to meet the organization’s objectives” (p.37). Verhoeven (1981) defines manpower planning as “a continuous matching of availabilities of personnel with certain qualifications and requirements for personnel with certain qualifications” (p.341). The process of strategic manpower planning consists, as described by Edwards (1983), of three main parts: “(a) predicting the future demand for manpower; (b) predicting the future supply of manpower; (c) looking at policies to reconcile any differences between the results of (a) and (b)” (p.1032).

According to Dreesch et al. (2005), the purpose of personnel planning in a health care organization is “to seek a balance or to address the mismatches between what is available in terms of HRH [human resources for health] and what is actually required to deliver the health services” (p.267). Birch et al. (2009) describe the purpose of health human resource planning as “ensuring that the right number and type of health human resources are available to deliver the right services to the right people at the right time” (p.856). The overall aim of strategic personnel planning is to timely signal any differences between the supply and demand for personnel in the future in order to take the necessary actions (Evers & Verhoeven, 1999).

Nkomo (1988) focuses her definition on the outcome of the planning process and defines strategic human resource planning as “the process used to establish human resource objectives, to develop strategies for attaining objectives and to identify policies governing the acquisition, utilization, development and maintenance of human resources” (p.67). Evers and Verhoeven (1999) combine different descriptions and define strategic personnel planning as “preparing, shaping, and implementing strategic policies regarding the inflow, through flow, and outflow of personnel, in such a way to effectively and efficiently allocate the workforce” (p.15, own translation).

At the strategic level of personnel planning the focus is relatively long-term, approximately three to five years, and the aim is to enable an organization to determine who is needed in the future to meet the strategic business objectives and to effectively deal with environmental contingencies and pressures (Evers & Verhoeven, 1999; Nkomo, 1988).

Producing exact and precise results is not feasible when planning for future personnel requirements; the function of personnel planning is “to assist management to develop systems and controls which enable the organization to make optimum use of its staff” (Buchan, 1994, p.461). Similarly, Sinclair (2004) argues that the objective of SPP should not be to predict the future, rather it should be a process used to build a context for decision making.

2.1.3 Elements of Strategic Personnel Planning

Edwards (1983) as well as Evers and Verhoeven (1999) mention that strategic personnel planning consists of three elements: (1) estimating the supply of personnel; (2) predicting the demand for personnel; and (3) determine the fit between the supply and demand. The supply of personnel in the future can be determined by the quantity, quality, and dynamics of the current workforce of an organization (Edwards, 1983; Evers & Verhoeven, 1999). The demand for personnel is influenced on the one hand by external forces such as changing demographics and technological changes (De Galan & Van Miltenburg, as cited in Evers & Verhoeven, 1999; Zeffane & Mayo, 1994), and on the other hand by the organization's corporate strategy (Edwards, 1983; Khoong, 1996; Nkomo, 1988). By comparing the future supply of personnel with the future demand for personnel, a gap appears which must be overcome by means of HR actions such as inflow, internal flow, and outflow policies. Figure 2 illustrates the basic components of SPP, based on the elements described above.

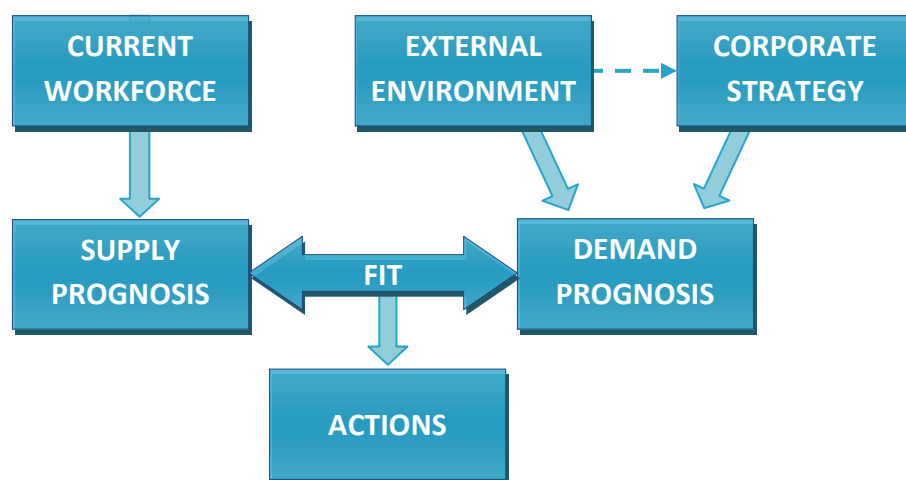


Figure 2 - Components of Strategic Personnel Planning

2.1.4 Conclusion

Since the late 1950s, strategic personnel planning has changed from a static, mathematical procedure to a problem-solving approach where the scientific and rational approaches were combined with qualitative and emotional aspects. Changes in the external and internal environment of an organization increase the interest in strategic personnel planning since SPP is a tool to help determine how to create the workforce necessary to cope with environmental contingencies and pressures and meet the strategic objectives of the organization.

Different definitions of strategic personnel planning have been described focussing on the process, the purpose, or the outcome of SPP. Most of these definitions consider SPP as a process of determining the supply, or availability, of personnel in the future on the one hand, and the demand for personnel in the future on the other hand. In addition, the definitions focussing on the purpose of SPP all focus on the difference between the supply of and demand for personnel in the future; in some definitions supply and demand is balanced, others focus on matching or reconciling the supply and demand. However, the resemblance in the definitions is that the fit between supply and demand is sought, based on which the necessary actions can be taken. The definitions focussing on the outcome of SPP describe the actions that can be taken based on the outcome of SPP. These actions

are related to the human resource (HR) policies and strategies aimed at inflow, internal flow and development, and outflow.

Although the definitions described in the previous paragraphs focus mainly on one of the three parts of SPP, in order to create a workable and complete definition for the purpose of the current research, all three parts (i.e. process, purpose, and outcome) should be included in the definition. In addition, the elements of strategic personnel planning form the basis for defining SPP. Figure 2 illustrates the different components of SPP including: estimate the supply of personnel; predict the demand for personnel; and determine the fit between supply of and demand for personnel. Part of the personnel available in the future is currently employed; therefore, the supply of personnel can be determined based on the current workforce of an organization. The demand for personnel in the future can be derived from the corporate strategy and changes in the external environment. In addition, comparing the supply of and demand for personnel in the future (i.e. the fit) results in actions to be taken to overcome any discrepancies.

Taking the elements of SPP into account and combining this with the definitions found in the literature, strategic personnel planning can be defined as follows:

Strategic personnel planning is the process of determining the quantity and quality of the future personnel required and the future personnel available in order to timely signal any differences between the supply and demand in the future, allowing an organization to implement HR policies with regard to the inflow, through flow, and outflow of personnel in order to effectively and efficiently allocate the workforce to meet the strategic objectives of the organization and cope with environmental contingencies and pressures.

This definition will be used throughout this report.

As shown in the table below, the above described definition of SPP covers all main components of the strategic personnel planning process. Although the current workforce appears not to be mentioned directly in the definition, it must be kept in mind that the future supply of personnel is based on data regarding the current workforce.

Part of the definition	Components of SPP
determine the quantity and quality of the future personnel required	demand prognosis
determine the quantity and quality of the future personnel available	supply prognosis
timely signal any differences between the supply and demand in the future	fit
implement HR policies ... to effectively and efficiently allocate the workforce	actions
meet the strategic objectives of the organization	corporate strategy
cope with environmental contingencies and pressures	external environment

Table 1 - Definition and Components of SPP

2.2 Instruments for Strategic Personnel Planning

As mentioned in the previous paragraphs, the basic SPP framework consists of the following steps: (1) portray the current workforce; (2) translate the current workforce into a prognosis of the future supply of personnel; (3) identify the external forces and the relevant strategic plans of the organization; (4) make a prognosis for the future demand for personnel based on the organization's strategy and the influential external forces; (5) compare the future supply with the future demand, which results in a gap or surplus. This gap or surplus between the future supply of and demand for personnel can be overcome by means of HR policies regarding inflow, internal flow, and/or outflow.

There are many different models, methods, techniques, and instruments to effectively and efficiently measure and/or portray each of the steps of strategic personnel planning (e.g. McClean, 1991; Nkomo, 1988; Purkiss, 1981; Reisman, Song, & Ikem, 1991). The following paragraphs set out to identify the instruments discussed in literature.

Many of the instruments described in the following sections have been adopted from social sciences, economics, and operations research (O'Brien-Pallas et al., 2001). Those adopted from social sciences include population-based models. For example, the manpower-to-population ratio was a popular method to estimate the supply and demand of personnel in the 1960s. The population-based models were altered over the years to include more details such as unemployment, work force participation, attrition, mobility, and population demographics. Models adopted from economics include the more complex, mathematical methods. These models were commonly used in the 1970s to estimate the demand and supply of personnel based on variables such as wages and vacancies (O'Brien-Pallas et al., 2001). O'Brien-Pallas et al. (2001) argue that, although the mathematical models provide useful frameworks for studying relationships (between, for example, wages, budgets, and demand for personnel), they do not sufficiently include external factors that influence the demand for personnel. Operations research models such as linear programming, Markov chains, and renewal methods have most frequently been used to forecast the supply for personnel (O'Brien-Pallas et al., 2001). Sinclair (2004) notes that although there are numerous variations in the terminology and the order in which different processes are performed, most models discussed in literature are very similar in essence.

Most personnel planning instruments concern groups of people, or organizational subgroups, since individual behaviour is difficult to predict. When aggregated to an organizational subgroup or unit, statistical patterns can be seen which increases the ability to forecast and make accurate predictions (McClean, 1991). Accordingly, most of the instruments described in the following paragraphs are intended to be used for analyzing or portraying separate departments within the organization, as opposed to the organization as a whole, or individual employees.

Although the subject matter concerns strategic planning, this does not mean that the SPP process should be performed at a management level only. The word *strategic* in strategic personnel planning refers to the focus on strategic objectives and long-term forecasting. When looking at the organizational hierarchy, the individual instruments are to be used on a tactical or operation level within the organization, albeit with central coordination.

Furthermore, the workforce of each department can be divided into subgroups based on occupation, skills, job title, or position within the department (Evers & Verhoeven, 1999; Gass, 1991; Price et al., 1980). This results in a manpower system with a number of homogeneous subgroups, making it easier to effectively apply the methods and techniques and consider each department or subgroup separately (De Feyter, 2007; Purkiss, 1981).

Some clarification is due regarding the influence of the external labour market. As described above, the supply of personnel is determined based on the current workforce, meaning that it establishes how the current workforce will transform over the years without any changes in policy (Evers & Verhoeven, 1999). The demand for personnel is derived from changes in the external environment and the strategic objectives of the organization (Evers & Verhoeven, 1999; Nkomo, 1988), thus illustrating what number and type of personnel is necessary in the future. So far, the external labour market is not included in the SPP process. After determining the fit between the supply of and demand for personnel in the future, the external labour market becomes important. Should, for example, the outcome be that additional personnel is needed to overcome the gap between supply and demand, it can be necessary to call upon the external labour market. By performing SPP several years in advance, the need for additional personnel can be signalled in advanced and HR policies can be tailored towards overcoming the gap.

2.2.1 Current Workforce

The starting point of the strategic personnel planning framework concerns portraying the current labour force. Part of the future workforce is currently employed. Therefore, it is important to first gather insights into the quantity, quality, and dynamics of the current personnel (Evers & Verhoeven, 1999). Factors to be included in this analysis are, for example, the numbers of employees per position; the skills of the current workforce; trends with regard to productivity and absenteeism; performance and potential of the employees; demographic profiles, and flow patterns (Evers & Verhoeven, 1999; Nkomo, 1988; Pynes & Lombardi, 2011).

Evers and Verhoeven (1999) mention that for planning purposes the following information is required:

1. The number of employees, their function, and their position within the organization;
2. The type of contract the employee has (e.g. part time or full time; temporary or permanent);
3. The educational background of the employees;
4. Demographics of the workforce, particularly the age of the employees;
5. Performance of the employees in their current positions;
6. Potential of employees to grow within the organization;
7. Data regarding the productivity, occupancy rate, and absenteeism.

There are different instruments to portray the current workforce's general information, the quantitative information regarding flow rates, and the quality of employees in terms of performance and potential. These instruments will be described in the following paragraphs. The necessary data consists of the actual information regarding the quantity and quality of the personnel currently employed, without any predictions or simulations.

2.2.1.1 General Information

First, the general information and characteristics of the personnel needs to be portrayed including the total number of employees per department, their function, the educational background of the employees, and the demographics of the workforce. This type of information is generally available in a personnel database.

➤ Personnel Information System

It is worthwhile to use a computer program to compile the data regarding the current workforce. Pynes and Lombardi (2011) mention that a computerized human resources information system (HRIS) to compile the data is the most accurate and easy way to maintain and organize the information. Besides, this type of data is often used for multiple purposes, including maintaining employee records, payroll activities, communicating with employees, training programmes, and keeping track of employees' career development. Therefore, this information is oftentimes already available to the organization (Pynes & Lombardi, 2011). The disadvantage of using such a system is that the system stores numerous types of data and information, meaning that the necessary information must be filtered out of all the data. Evers and Verhoeven (1999) describe the use of a similar system, which they refer to as a personnel registration and information system (PRIS).

2.2.1.2 Quantitative Information - Flow

Besides the general data concerning the employees, data regarding inflow, through flow and outflow can be portrayed (Evers & Verhoeven, 1999). By means of describing the flow over the past year(s), estimations can be made with regard to the future flow. The methods that can be used to predict future flows are described in Section 2.2.2 concerning the estimation of the supply of personnel in the future. However, input for these methods is needed in terms of data regarding current flow rates and trends, which can be modelled by means of the IDU-matrix or the survivor function.

➤ IDU-matrix

The IDU-matrix is a matrix to numerically represent the flow of the workforce (Evers & Verhoeven, 1999). The acronym IDU stands for the Dutch words for inflow, through flow, and outflow (instroom, doorstroom, uitstroom). To use the matrix, the workforce is divided into different categories based on the level of the functions (i.e. management, team leader, lower employee). For each category the inflow, through flow, and outflow are represented in the matrix. By completing the matrix with the flow numbers, an overview is created of all flow in a certain period of time. With this data, calculations can be made regarding the internal mobility, the flow percentages per category, and the overall dynamics of the current workforce. Besides portraying current workforce characteristics, the IDU-matrix can form a useful tool for estimating the supply of personnel in the future (Evers & Verhoeven, 1999).

➤ Survivor-function

The survivor function is a method to determine the survivor rate of new employees (i.e. how many of the new employees are still working for the organization after X years?) (Evers & Verhoeven, 1999). The survivor-function has been defined by Edwards (1983) as "the wastage pattern of a group of staff" (p.1035). There are two methods for analyzing the survivor-function: the cohort method and the census method (Edwards, 1983).

The cohort method analyses a group of new employees (a cohort) and displays graphically how many of these employees are still employed by the organization at a certain point in time. By creating similar graphs for different cohorts, the flow intensity per cohort can be compared with that of other cohorts (Edwards, 1983).

If the data required to perform the cohort method is not available per individual, an alternative method is the census method (Edwards, 1983). This method does not focus on one cohort over a period of time but uses snapshots of multiple similar groups at one point in time. The census method assumes that the reasons for employees to leave the organization do not depend merely on the number of years an employee has worked for an organization.

2.2.1.3 Qualitative Information – Performance & Potential

The information collected by means of the previously described instruments consists solely of general and quantitative information which does not illustrate the quality of the current workforce. Qualitative information in terms of performance and growth potential of employees is necessary to incorporate in order to create a complete picture of the current workforce (Evers & Verhoeven, 1999). The performance and potential of employees can be modelled by means of the HR3P-matrix or the Vlootschouw, two similar approaches to model the quality of the workforce.

➤ HR3P-matrix

The HR3P (Human Resources Performance Potential Portfolio) matrix is a method to portray the performance and potential of the employees who are currently employed, developed by Evers, Van Laanen and Sipkens in 1993 (Evers & Verhoeven, 1999). It is both a method to analyze the current performance of employees, as well as their growth potential.

The HR3P-matrix is a four-by-four matrix where each individual employee is plotted in one of the sixteen squares of the matrix based on his or her current performance (scores ranging from unsatisfactory to excellent) as well as their growth potential with the options (a) reached full potential; (b) has growth potential within his/her current function profile; (c) can be promoted in the short term; and (d) can be promoted now. The current performance of the employee is based on the criteria as specified in an employee's job description.

The completed matrix provides an overview of the current performance and growth potential of the employees based on which actions can be taken if necessary. The HR3P method is relatively simple to use since it does not require any mathematical calculations or time consuming analyses. The downside of the matrix is that, although criteria are used based on which the employees are plotted in the matrix, the outcome is fairly subjective.

➤ Vlootschouw

Many consultancy firms have developed tools based on the HR3P-matrix to portray and analyze the performance and/or potential of the current workforce. These tools are often referred to as a so-called Vlootschouw. An example is the HR Portfolio Management tool developed by Breeveld (Breeveld, 2011). The tool he developed consists of a matrix similar to the HR3P-matrix described above as a means to model the performance and growth

potential of employees. The Vlootschouw matrix developed by Breeveld (2011) consists of four groups in which employees can be classified: rising stars, solid citizens, eager learners, and problem children. The distinction between different Vlootschouw matrixes developed by various consultancy firms is merely in the names of the groups in which employees are classified, or the number of different groups.

The main benefit of this Vlootschouw is, similar to the HR3P method, that it is straightforward and simple to use and provides a good overview of the current workforce (Breeveld, 2011). However, like the HR3P-matrix, the outcome of the Vlootschouw remains rather subjective.

2.2.1.4 Summary

In the previous paragraphs, five different instruments have been described that can be used to portray and measure the quality and the quantity of the current workforce. There are advantages and disadvantages to each instrument. For example, an advantage of four of the instruments is that they provide a clear overview of the current situation. However, the IDU-matrix requires detailed information which might not be available, while the HR3P-matrix and the Vlootschouw produce subjective outcomes. These advantages and disadvantages are important to consider when determining which instruments are most suitable to be used by MST.

Table 2 provides a summary of the instruments described above, including the main advantages and disadvantages of each instrument.

	Instrument	Description	Advantages	Disadvantages
Current Workforce	Personnel Information System	Provides an overview of the general information of all employees.	Most accurate; usually the information is already available.	Large amount of data that needs to be filtered.
	IDU-matrix	Provides a numerical overview of all inflow, internal flow, and outflow.	Numerical representation; clear overview of flow.	Requires detailed flow information as input.
	Survivor-function	Provides input for determining the future supply of personnel.	Clear overview; beneficial if used together with a method to estimate the future supply of personnel.	Instrument itself does not provide essential information.
	HR3P-matrix	Portrays the quality of the current performance and growth potential of employees.	Can be used for other purposes; simple overview; easy to compute and interpret results.	Outcome is rather subjective.
	Vlootschouw	Similar to the HR3P-matrix, usually developed by consultancy firms.	Can be used for other purposes; simple overview; easy to compute and interpret results.	Requires payment; outcome is rather subjective

Table 2 - Summary Instruments Preliminary SPP Framework - Current Workforce

2.2.2 Supply of Personnel

The starting point of planning the available supply of personnel in the future is the current workforce and the mutations that can be expected within the current workforce (Evers & Verhoeven, 1999). “The supply side represents the availability and the characteristics of the health workforce at the present moment or at a future point in time” (Dreesch et al., 2005, p.268).

In the previous section, several instruments have been described to measure and portray information and characteristics of the current workforce and its dynamics. The data obtained through these measurements provide the input for estimating the supply of personnel in the future. The instruments that can be used to estimate the future supply of personnel are described below. These instruments are descriptive in nature; they use statistical techniques to imitate the behaviour of the organization (Price et al., 1980). Descriptive models are used in many different organizations to portray the workforce areas in which decisions need to be taken (Purkiss, 1981).

The main distinction between the different descriptive models is in the way the internal flows arise (Edwards, 1983). For example, the Markov chain assumes that the internal flows are dependent on past flow trends, assuming that employees are pushed in a certain direction; whereas pull-models assume that internal flow is governed by a pull-mechanism meaning that vacancies in one department pull personnel towards that department to fill the vacancy.

➤ **Markov chain – push-model**

The Markov models, also known as push-models, assume that the dynamics of a workforce are predictable, meaning that a workforce is pushed in a certain, known, direction governed by a Markov chain (Venema & Wessels, 1988). Gass (1991) describes three Markov assumptions: “(1) each individual is governed by a Markov process, i.e. only the last state occupied determines the individual’s future; (2) the same Markov process applies to all individuals; and (3) all individuals behave independently” (p.66).

The input for the Markov model consists of data regarding the flow of personnel, for example collected by means of the IDU-matrix (described in Section 2.2.1). By analysing the flow patterns between categories over a number of years, a prediction can be made with regard to the future flow of personnel between categories (Evers & Verhoeven, 1999; Purkiss, 1981). The main benefit of Markov models is that they are relatively easy to compute (McClean, 1991). However, Markov models ignore the number of vacancies that are currently available and are mainly useful for organizations where the requirements of the future workforce are not known for certain (Ward, 1987).

➤ **Semi-Markov model**

The semi-Markov model is more complicated to compute than the Markov approach (McClean, 1991). The additional functionality of the semi-Markov model is that it uses conditional transition probabilities which are dependent on the length of time a person stays in a subgroup before this person moves to another state (De Feyter, 2007). As a result, the semi-Markov model is more flexible compared to the Markov model; however, the semi-Markov model is more difficult to mathematically calculate (McClean, 1991).

➤ **Renewal theory approach – pull-model**

In renewal models, flows between categories only take place when a job position opens up (Purkiss, 1981). Rather than being ‘pushed’, personnel flows are determined by ‘pulls’, as is often the case with promotions (McClean, 1991). The renewal model, or pull-model, looks at the yearly vacancies in certain categories and assumes that these vacancies will be filled internally, pulling personnel from one category to another (Evers & Verhoeven, 1999). Similar to the Markov model, the input for the renewal model consists of the data regarding the flow of personnel. This data is combined with data from the survivor-function (Evers & Verhoeven, 1999). The benefit of these models is that they are easy to interpret and understand, and that they are flexible in use. However, these models require a large amount of data as input, and consist of relatively complex mathematical calculations (Ward, 1987).

➤ **Combination of Markov chain and renewal model**

There are models that combine the benefits of the Markov models with those of the renewal models. For example the Kent model (Edwards, 1983; Purkiss, 1981), originally developed for the UK Civil Service, allows for modelling complete personnel systems with mixtures of push and pull flows. Another example is the Cambridge model (Edwards, 1983; Evers & Verhoeven, 1999). The main difference between the Kent and the Cambridge model is that the Kent model focuses explicitly on data regarding internal flow whereas the Cambridge model uses typical numbers to estimate flows between categories of personnel, thereby avoiding the need for data on internal flows (Edwards, 1983). For example, numbers regarding the typical age at which one gets a promotion or the percentage of people from a category that gets promoted. With these data, combined with the age distribution of a category and the current inflow into the category, the long-term effects can be estimated (Keenay, Morgan, & Ray, 1977). The downside of the Cambridge model is that it makes many assumptions by using typical numbers, making the model less applicable in a dynamic, complex, and changing environment (Evers & Verhoeven, 1999).

The FORMASY-model (Purkiss, 1981; Verhoeven, 1981) is similar to the Kent model but has more benefits when used with complex manpower systems (Purkiss, 1981). FORMASY (FOre-casting and Recruitment in MAnpower SYstems) enables the user to obtain information regarding the characteristics of the current labour force as well as expected characteristics of the future labour force, such as education, age, and qualification (Verhoeven, 1981). The FORMASY model uses the Markov chain model as a basis, with the added functionality of modelling the dynamic behaviour of employees (Wessels & Van Nunen, 1976). The main disadvantage of the FORMASY-model is that it is a statistical computer-based model developed in the early 1980s and requires a wide variety of complicated data as input.

➤ **Vacancy chain model**

A model similar to the renewal model is the vacancy chain model which, like the renewal model, considers the movement of vacancies (McClean, 1991). The vacancy chain model is a mathematical model developed by Stewman and Konda in 1983 (as cited in Evers & Verhoeven, 1999). It allows for the demographics of the workforce to be portrayed along with the internal flows of individual employees. The promotion possibilities of individual employees are dependent upon the number of vacancies, the vacancy chain effect (filling a

vacancy in one category by means of internal flow, automatically results in a vacancy in another category), the size of the category, and the preference of the manager towards internal or external recruitment (Evers & Verhoeven, 1999). The benefit of the vacancy chain model is that the outcome can be easily related to management decisions and offers the possibility to consider the structure of both the current workforce as well as the supply of the future workforce (Evers & Verhoeven, 1999).

➤ **Employee-object model**

According to Geerlings, Verbraeck, De Groot, and Damen (2001), the supply of personnel in the future consists of the competencies of the employees. They argue that, apart from the number of employees, the competencies of employees change over time and are a valuable variable to consider when creating a personnel plan.

The employee-object model portrays the developments of employees over time, including inflow, through flow, and outflow (Geerlings, Verbraeck, De Groot, et al., 2001). An employee can be in one of the five states: (1) not employed; (2) employed active; (3) being educated; (4) ill; and (5) discharge. Besides, the employee active state can be further broken down into three states: (1) freeze on function; (2) functionless; and (3) free to change function. During each of these states, an employee can gain competencies (e.g. through being educated), loose competencies (e.g. obsolescence of certain competencies), or the competencies can remain the same. Data regarding the current workforce forms the input for the model with regard to through flow and outflow. The future inflow is based on estimates. By determining how many employees are in which of the five stages, an analysis can be made of the inflow, internal flow, and outflow over a certain period of time, based on which estimates can be made with regard to the number and competencies of personnel in the future. The employee-object model is useful when the behaviour of employees in the employee active state can be predicted since it assumes that an employee remains in a function during a set period of time. The main disadvantage of the employee-object model is that it requires much information on competencies, which, if not yet available, takes much time to collect.

➤ **HR3P-matrix, Vlootschouw, and P&P matrix**

The HR3P-matrix and the Vlootschouw have been described previously in this chapter as tools to measure the performance of the current workforce. With some alterations, the HR3P-matrix containing information about the current workforce can also be used to estimate the future potential of the workforce and provide an impression of which flows (specifically through flow and/or outflow) are likely to occur in the near future.

To simplify, the HR3P-matrix can be transformed to a two-by-two grid similar to the Vlootschouw and the BCG-matrix developed by the Boston Consulting Group. The BCG-matrix is one of the most well-known and simple portfolio planning matrices generally used for business portfolio management by determining the growth potential of a business, product, or market and the relative market share (David, 2007). However, with some adjustments, the BCG-matrix can be used for performance and potential portfolio management (Dijkstra, 2008). Thus, by combining the HR3P-matrix, with the Vlootschouw and the BCG-matrix, a new model is created which can be used to estimate the quality of the

personnel available in the future. This new model will, throughout the remainder of this report, be referred to as the performance and potential (P&P) matrix. As previously mentioned, the disadvantage of these types of instruments is that although the outcome is simple to understand and interpret, it is rather subjective since completing the matrix is done based (personal) opinions and experiences.

2.2.2.1 Summary

Above, seven instruments have been described that can be used to estimate the future supply of personnel. These models are all descriptive in nature meaning that they use statistical techniques to predict the future supply. The main disadvantage of this is that the instruments are mechanistic and require a large amount of data as input. The difference between the above described instruments is in the way internal flows arise: pull-models assume that vacancies in a department cause internal flows, whereas push-models assume that internal flow depends on past flow trends.

Table 3 summarizes the seven instruments described in the paragraphs above. Special emphasis is placed on the advantages and disadvantages of each instrument which is necessary to determine which instruments are most suitable to be used by MST.

	Instrument	Description	Advantages	Disadvantages
Supply Prognosis	Markov chain (push-model)	Predicts future flows of personnel based on the assumption that personnel is pushed in a certain direction.	Clear representation of expected flows; simple to interpret results; useful when future demand is uncertain.	Mechanistic, require large amount of data; complex statistical equations.
	Semi-Markov model	Similar to the Markov model but uses conditional transition probabilities.	More flexible than Markov chain.	Mechanistic, require large amount of data; complex statistical equations; more complicated than Markov chain.
	Renewal theory approach (pull-model)	Predicts future flow of personnel based on the assumption that personnel is pulled in a certain direction caused by vacancies.	Simple to interpret; flexible.	Mechanistic, require large amount of data; complex statistical equations.
	Combination of Markov and Renewal	Mixture of pull and push flows.	More possibilities than push or pull model.	Require large amount of data; complex statistical equations; uses many assumptions regarding flow.
	Vacancy chain model	Similar to the Renewal theory approach but uses more variables and transition probabilities.	Considers structure of both current workforce and future supply of personnel.	Does not provide realistic information when not all vacancies are filled internally; requires the demand for personnel to be known.
	Employee-object model	Estimates the future development (in terms of competencies) of employees based on past flow trends.	Benefits when combined with function-object and matching-object model.	Complex; difficult to interpret results; requires large amount of data.
	HR3P-matrix; Vlootschouw; P&P matrix	Portrays the quality of the current workforce and provides an impression of expected flows in the future.	Can be used for other purposes; simple overview; easy to compute and interpret results.	Outcome is rather subjective.

Table 3 - Summary Instruments Preliminary SPP Framework - Supply Prognosis

2.2.3 External Environment & Corporate Strategy

The quantity and quality of the personnel required in the future depends largely on the external environment (Zeffane & Mayo, 1994) and the organization's strategy (Edwards, 1983; Khoong, 1996; Nkomo, 1988). The corporate strategy defines how an organization wants to develop itself over the years; it provides long-term objectives and the vision and mission of the organization aimed to give direction to the business and its processes (David, 2007). Thereby, the organization's strategic objectives provide valuable guidelines regarding the demand for personnel.

In addition to the organization's strategy, the external environment influences the demand for personnel in the future. This works in twofold: on the one hand, the influences of external forces have already been considered in the development of the organization's overall strategy; the corporate strategy sets out how the organization aims to cope with the external environment (this is illustrated in Figure 2 by the dotted arrow between the external environment and the corporate strategy). On the other hand, there are certain environmental forces that can change rapidly, or forces of which the impact is uncertain. While the corporate strategy assesses the influences of external factors over a longer period of time (i.e. 5 years) for the organization as a whole, SPP considers the influence of the external environment on a yearly basis on a departmental level.

2.2.3.1 Corporate Strategy

The strategic plans and the mission and vision of the organization set out the future direction of the organization. "Strategies are the means by which long-term objectives will be achieved" (David, 2007, p.13). Translation of the corporate strategic objectives into the area of human resources results in guidelines regarding the demand for personnel in the future (Evers & Verhoeven, 1999). For example, a corporate strategy may involve specialization in a certain area of expertise, increasing the need for specialized personnel in that area; or a complete reorganization, a change in the organization's structure, or downsizing can have major effects on the future demand for personnel. Thereby, the corporate strategy provides the guidelines along which the requirements for the personnel in the future can be determined.

➤ Summary of strategic objectives

For the purpose of determining the number and quality of personnel required in the future, the corporate strategy must be known and the issues relevant for personnel planning must be identified. The most straightforward method for identifying the relevant issues and strategic objectives is to display the items in a simple and clear overview, summarizing the main strategic objectives relevant for personnel planning.

2.2.3.2 External Environment

Research conducted up to the late 1980s often fails to pay attention to modelling and estimating the influence of external factors on the demand for personnel. Purkiss (1981) describes that external factors "make a nonsense of the most carefully developed scenario" (p.317); demand forecasting in the 1960s is referred to as a 'heroic attempt' and therefore a very flexible philosophy has been adopted where the demand for manpower is related to the business activities rather than external factors. Similarly, Edwards (1983) argues that the future demand for personnel depends mainly on the level of activity of an organization at a certain point in time. However, according to De Galan and Van Miltenburg (as cited in Evers & Verhoeven, 1999), changes in the economic context,

technological context, and labour market context are important determinants for the demand for personnel in the future. An analysis of the external environment of the organization is needed to monitor the changes that take place and the impact these changes have on human resource policies and the demand for personnel (Nkomo, 1988). The external factors can be portrayed by means of a PEST analysis. Next, the impact the external issues are expected to have needs to be highlighted, which can be illustrated in an EFE matrix.

➤ **PEST analysis**

The external factors influencing an organization can be described in many ways. An example is the PEST analysis which describes the political, economic, socio-cultural, and technological factors effecting an organization. Different variations to the PEST analysis exists: for example the STEP analysis where the order of the forces is changed; a PESTLE analysis where legal and environmental factors are considered in addition to the PEST factors; or a STEEPLE analysis where, in addition to legal and environmental factors, ethical factors are included in the analysis (David, 2007). The completed PEST analysis provides a clear overview of the external factors influencing an organization; however, computing the analysis can be difficult for those not familiar with this type of reasoning (David, 2007).

➤ **EFE matrix**

After portraying the external factors, they can be summarized and evaluated by means of an External Factor Evaluation (EFE) Matrix (David, 2007), where each external factor is ranked based on the importance and the effect that factor has on the issue under investigation (in this case the demand for personnel in the future), and how well the organization is currently coping with the factor. The latter is used to evaluate the organization's current strategy and provides focus points regarding areas of improvement. The EFE matrix helps determine which external factors are most influential in establishing the requirements for the future workforce. Although an advantage of the EFE matrix is that it provides a simple and clear representation of the importance of the external factors, the outcome is rather subjective and the person completing the matrix can be biased. In addition, the EFE matrix requires input from the PEST analysis, meaning that the quality of the PEST analysis determines the quality of the outcome of the EFE matrix.

2.2.3.3 Qualitative Methods

Qualitative methods such as the Delphi-method and the EFTE-method can be used to determine the influence of external factors on the demand of personnel or point out relevant strategic objectives and issues (Dreesch et al., 2005). These methods are mainly based on opinions and experiences of professionals inside and outside the organization (Evers & Verhoeven, 1999). The main benefit of these methods is that it can be valuable to include opinion's experts into a decision making process. In addition, both methods aim to reach one convergent opinion. However, both the Delphi-method and the EFTE-method are time consuming instruments.

➤ **Delphi-method**

Evers and Verhoeven (1999) describe the Delphi-method as a tool to gather qualitative information from a team of experts (e.g. managers, team leaders). The study consists of different rounds. First, the experts answer questions anonymously and individually. Next, the

answers are randomly and anonymously distributed to the participants. After reviewing the answers provided by other participants, each person can change his or her original opinion. After completing this several times, a certain convergence in opinions should be present. This exercise is continued until one convergent opinion is reached. By feeding back the information anonymously, the quality of the answers is improved.

➤ **EFTE-method**

Another qualitative method described by Evers and Verhoeven (1999) is the EFTE-method. The EFTE-method is similar to the Delphi-method in that it gathers qualitative information by means of interviewing experts (e.g. managers, team leaders). The main difference is that the EFTE-method stimulates discussion between the participants. The EFTE-methods consists of four steps: Estimate, Feed-back, Talk, and Estimate. First, the opinions of the individual participants is estimated, after which the opinions are randomly and anonymously distributed to the participants. After feed-back, the participants discuss the opinions and are allowed to adjust their original answer. Similar to the Delphi-method, a consensus regarding the answers is expected to appear after the exercise is repeated a few times.

2.2.3.4 Summary

The sections above described five instruments that can be used to portray and analyze the external environment and the strategic objectives of a department. Most of these instruments are interrelated: the EFE matrix requires input from the PEST analysis; the Delphi and/or EFTE method can be used to complete the PEST analysis, the EFE matrix, and summarize the strategic objectives. The disadvantage of these instruments is that they can be difficult to use if the user is not familiar with strategic issues and decision making. Including the opinion of experts can be beneficial in overcoming this disadvantage, although both the Delphi and the EFTE method are time consuming. The following table summarizes the instruments described in the previous paragraphs and their main advantages and disadvantages.

	Instrument	Description	Advantages	Disadvantages
External Environment & Corporate Strategy	PEST analysis	Describes the external environment in terms of political, economic, socio-cultural, and technological factors.	Clear overview; can be used for other purposes (i.e. development of annual plans; create awareness).	Can be difficult to compute.
	EFE matrix	Ranks the external factors based on their impact/importance.	Simple representation of results; allows importance of external factors to be ranked.	Outcome is rather subjective; quality depends on quality of PEST analysis.
	Strategic plans	Summarizes the strategic objectives that influence the department's workforce.	Clear overview; simple to interpret results.	Difficult to compute; need a clear corporate strategy as input.
	Delphi method	Gathers qualitative information (opinions) from a team of experts.	Include opinions of experts.	Time consuming; no face to face discussion.
	EFTE method	Similar to the Delphi method but includes a discussion between experts.	Include opinions of experts; allows for discussion among participants.	Time consuming.

Table 4 - Summary Instruments Preliminary SPP Framework - External Environment & Strategic Objectives

2.2.4 Demand for Personnel

The demand for personnel should be estimated both in terms of quantity as well as quality of the personnel, so as to result in an estimation of the number of employees needed in the future, as well as forecast the qualitative properties needed to meet the organization's strategic objectives and cope with environmental pressures (Nkomo, 1988). As previously mentioned, the corporate strategy provides the guidelines and focus points for determining the personnel required in the future; the external factors influence if and how the strategic objectives can be reached on a yearly basis.

As described in the previous section, external factors can have a great impact on the demand for personnel in the future. However, the exact influence of external forces on an organization and its labour force is difficult to predict (Schoemaker, 1995). Scenario planning can help portray the possible influences of such uncertainties. The different scenarios to be developed form the basis upon which the future demand can be determined. In addition to scenario planning, quantitative and qualitative methods can be used to determine the future demand for personnel.

2.2.4.1 Scenario Planning

"Scenario planning is a disciplined method for imaging possible futures" (Schoemaker, 1995, p.25). The essence of scenario planning is that it combines a great amount of data into a small number of possible scenarios, allowing for the combined impact of different internal and external uncertainties to be explored (Schwartz & Ogilvy, 1998). Scenarios do not forecast what the most likely future state is; rather they provide an overview of multiple different possibilities (Enzmann, Beauchamp, & Norbash, 2011).

Schwartz and Ogilvy (1998) describe the process of scenario development as plotting scenarios. To plot scenarios, first the two most important external forces are selected, based on which the scenarios are developed. Schwartz and Ogilvy (1998) describe several typical plots including: the winners and losers plot which is based on the assumption that only one company can win, the others will lose; the good news/bad news plot which incorporates elements that are desirable as well as undesirable elements; and the evolutionary change plot which assumes that over time everything grows or declines. Developing different scenarios forms an important part in supporting decision making (Venema & Wessels, 1988). Oftentimes, creating scenarios is a cyclical process: the evaluation of one scenario results in the development of new scenarios.

Although scenario planning helps to create awareness with regard to the impact of internal and external forces, the many different possible outcomes can make it difficult to interpret the results and determine what the most important forces are.

2.2.4.2 Quantitative Methods

Quantitative methods estimate the future demand for personnel based on historical data (Verhoeven, 1983). Verhoeven (1983) distinguishes between exploration methods where time is the most important factor, and correlation methods which assume a causal relationship between the future demand for labour and other variables.

➤ **Exploration methods**

There exist many different exploration methods (Geerlings, Verbraeck, Toussaint, & De Groot, 2001). By using an exploration method, only the factor time plays a role in determining the required workforce for the future (Verhoeven, 1983). A very basic extrapolation method involves estimating the future demand based on the assumption that there will not be any changes in the demand for personnel in the future. Another exploration method is known as the growth-factor method (Evers & Verhoeven, 1999) and is used by multiplying the current demand for personnel by a growth factor. This growth factor can relate to the growth in production or to the historic growth in the number of employees. The advantage of the exploration method is that it is fairly simple to compute. However, the downside is that exploration methods only include the factor time, meaning that it is questionable whether they produce a realistic outcome.

➤ **Correlation models**

Correlation methods assume that there is a relationship between the labour force required in the future and other variables (e.g. external developments) (Verhoeven, 1983). For example, a correlation method could determine that there is a direct relationship between the rate of technological developments and the workforce the organization requires in the future. Using correlation methods requires a good insight into variables that can have an effect on the future demand for personnel. However, a disadvantage of correlation models is that there is oftentimes no direct relationship between different variables. The relationships between variables are often moderated or mediated by other variables (Geerlings, Verbraeck, De Groot, et al., 2001).

Geerlings, Verbraeck, De Groot, et al. (2001) argue that exploration and correlation models only determine the necessary quantity of the workforce, thereby ignoring the quality of employees. Therefore, they developed the function-object model, where the competencies needed to perform a particular function is the key variable.

➤ **Function-object model**

The function-object model describes the number of personnel who are occupying the function and the necessary employees in that function as specified in the organization's strategic plans (Geerlings, Verbraeck, Toussaint, et al., 2001). The essence of this method is to assess whether the quantity and quality of employees occupying a certain function is equal to the quantity and quality of employees necessary for that function. There are three states within the model: (1) function is understaffed; (2) function is overstaffed; and (3) function in balance. To use the function-object model, the different functions within the organization or department are combined and converted into cluster of function objects where functions necessary in the future are derived from future plans (Geerlings, Verbraeck, De Groot, et al, 2001). The functions are then defined as required competencies to occupy a certain function. The function-object model is best used together with the employee-object model.

2.2.4.3 Qualitative Methods

In the previous section, the Delphi-method and the EFTE-method have been described as qualitative methods used to determine the influence of external factors on the demand of personnel or point out relevant strategic objectives and issues. These methods can also be used in combination with a quantitative method to estimate the required future workforce (Evers & Verhoeven, 1999).

2.2.4.4 Summary

Throughout the previous paragraphs, different instruments have been described that can be used to determine the demand for personnel in the future. First, scenario planning has been described as a means to explore the combined impact of different internal and external forces by assessing different possible futures. Although formulating different possibilities regarding future states helps increase awareness regarding the internal and external influential forces, the different outcomes that are created can make it difficult to interpret the results and draw clear conclusions. In addition to scenario planning, exploration methods and correlation methods have been described. Although both these instruments are fairly simple to use, they are static and might therefore not produce a realistic outcome in a dynamic environment. Finally, the EFTE and the Delphi method have been described. These methods are the same methods as described in Section 2.2.3 and aim to include the opinion of experts into the process.

The table below summarizes the instruments that can be used to make a prognosis of the demand for personnel in the future. In addition, the advantages and disadvantages of each instrument are highlighted since these will be used to determine what the best instruments are for MST.

	Instrument	Description	Advantages	Disadvantages
Demand Prognosis	Scenario planning	Explores the combined impact of different internal and external forces.	Explore possible futures; create awareness regarding the impact of internal and external factors.	Many different outcomes are possible; does not provide one answer; can be difficult to interpret results.
	Exploration methods	Estimate the demand for personnel in the future based on the demand for personnel in the past.	Simple to compute.	Mechanistic; only considers the factor time, therefore not a realistic perspective.
	Correlation methods	Estimate the demand for personnel in the future by assuming a relationship between the demand and other variables.	Simple to compute.	Mechanistic; oftentimes no direct relationship exists.
	Function-object model	Describes the demand for personnel based on the corporate strategy.	Incorporates qualitative aspects.	Works best when used together with employee-object model.
	EFTE/Delphi method	Gather qualitative information (opinions) from a team of experts (as described above).	Include opinions of experts.	Time consuming.

Table 5 - Summary Instruments Preliminary SPP Framework - Demand Prognosis

2.2.5 Fit between Supply and Demand

The analysis of the current workforce results in an estimation of the quantity and quality of the personnel available in the future. The external analysis, identification of the relevant strategic objectives, and the thereon based estimation of the demand for personnel in the future provide an indication of the required future workforce. By comparing the estimated future supply of personnel with the estimated demand for personnel in the future, it is likely that discrepancies appear, either in the form of a shortage or surplus of personnel. Based on this, HR policies with regard to, for example, recruitment and internal mobility can be implemented to overcome this gap. There are different options to determine the fit between the supply of and demand for personnel in the future: a simple table can be used to calculate the difference between the forecasted supply and demand, or in certain cases the matching-object model can be used.

➤ **Fit table**

In order to estimate the fit between supply and demand, simple calculations can be performed where the difference between the estimated future number of employees available (supply) and the number of employees required in the future (demand) is calculated, resulting in a surplus or shortage of personnel. Throughout the remainder of this report, this table will be referred to as a fit table. Although a fit table is simple to create and provides a clear overview of all information concerning the supply of and demand for personnel in the future, it only includes numerical data.

In certain cases, a model can be used to calculate the fit between demand and supply. When the employee-object method has been applied to determine the supply of personnel and the function-object model has been used to establish the demand for the future workforce, the matching-object model can be used to determine the fit.

➤ **Matching-object model**

The matching-object model developed by Geerlings, Verbraeck, De Groot, et al. (2001) is based on combining the employee-object model (as described in Section 2.2.2) with the function-object model (described in Section 2.2.4). Both the functions in the function-object and the employees in the employee-object have been defined with the variable competencies, making it possible to compare. Based on the prognoses of the supply of personnel in the future and the demand of personnel in the future, different strategies can be used to examine whether an employee and function requirements match. In case an outcome of the function-object model is that a certain function is understaffed, the matching-object model is used to find a suitable candidate for that function. On the other hand, when a function is overstaffed, the employees with the right qualities and best fit with the function are identified.

2.2.5.1 Summary

Two instruments have been described to determine the fit between the supply of and demand for personnel. The fit table is a simple and clear numerical overview of all information gathered throughout the SPP process (i.e. current workforce; supply prognosis; demand prognosis). The matching-object model also provides an overview of previously collected information, although the

input for this model consists of the outcome of the employee-object model and the function-object model.

The table below summarizes the two instruments that can be used to determine the fit between the supply of and demand for personnel in the future. The advantages and disadvantages of each instrument are highlighted since these are important to consider when determining which instrument is most suitable to be used by MST.

	Instrument	Description	Advantages	Disadvantages
Fit	Fit table	Calculates the difference between the supply prognosis and the demand prognosis.	Simple to compute; summarizes all information; clear overview.	Only includes quantitative data.
	Matching-object model	Combines the employee-object model with the function-object model to determine the fit.	Provides a detailed overview of the fit; suggests possible strategies to overcome discrepancies.	Can only be used together with the employee-object model and function-object model.

Table 6 - Summary Instruments Preliminary SPP Framework - Fit

2.2.6 Complete Frameworks

Besides the before mentioned instruments to measure the individual steps of the SPP framework, some examples can be found of complete strategic workforce planning frameworks. The model developed by Zeffane and Mayo (1994) and the SHARP framework developed by Denton, Gafni, and Spencer (1995) are examples of models designed to cover all necessary parts of a personnel planning framework, from estimating the future supply of personnel, to predicting the future demand for personnel, and calculating the fit between the supply and demand. In addition, there are readymade software packages available for an organization to purchase and use for SPP.

➤ **Zeffane and Mayo model**

Zeffane and Mayo (1994) propose a model based on the Markov chains theory. In this model, the core matrix consists of personnel forecasts, combined with a number of secondary matrices that represent constraints which affect changes in the core matrix. The essence of this model is to consider the effects of one constraint on employment, followed by incrementally including the effects of the other constraints. When operationalizing the model, first a forecast of the demand and supply of personnel is made based on the mobility rates of the current workforce and the desired output levels per job category. Next, the different matrices consisting of different internal and external constraints are added. The final step aims to provide the actual forecast per category including different alternatives with regard to human resource policies and actions (Zeffane & Mayo, 1994). The main advantage of this model is that it is readymade and thus ready to use. However, since it is readymade it cannot be tailored towards the requirements of a specific organization. A shortcoming of the model is that it merely focuses on quantitative data.

➤ **SHARP framework**

Denton et al. (1995) developed a framework specifically for the health care sector: the SHARP (System for Health Area Resource Planning) framework is an analytical framework

designed to plan health care services. SHARP is made up of seven microcomputer-based models: the first two are used to portray the population to be served and the demands for health care services; the next four models display the availability of health care services including personnel and capacity of the hospital. The first two models result in an estimate of the demand for health care; the next four models result in an overview of the current availability of health care which can be translated into the future supply of health care services. The results of these models are compared to each other by means of a balance evaluation model to find the fit between supply and demand (Denton et al., 1995).

The SHARP framework is different from other frameworks and models described in the previous paragraphs in that it not only estimates the current and future workforce but also considers health care services such as the number of beds in the hospital and occupancy rates. Similar to the Zeffane and Mayo model, the disadvantage of the SHARP framework is that it cannot be tailored towards the specific needs of an organization. In addition, the SHARP model is a computer program developed in the 1990s meaning that it might not be up-to-date in the current setting.

➤ **Software Packages**

Sinclair (2004) describes the growing number of software packages that become available to help an organization conduct strategic personnel planning. The main benefit of a software package is that it offers guidance and assistance throughout the entire SPP process. In addition, most software packages can be tailored towards the needs and requirements of an organization. However, according to Reilly (1996) organizations do not need a complete software package for SPP. Reilly (1996) argues that software packages are often complicated and make use of complex statistical calculations which do not take into account the highly unstable and ever changing environment organizations operate in. Besides, readymade software packages are often highly expensive, especially when they offer the possibility to be tailored to the needs of the organization.

➤ **Frameworks and instruments developed by consultancy firms**

Besides the instruments described previously, a great number of instruments have been developed by consultancy firms. These firms offer complete SPP tools, or methods to analyze part of the SPP process. For an organization to use the tools developed by consultants, a fee must be paid which is usually quite substantial for large organizations. In addition, the consultancy firm is generally involved in the implementation of the instruments. This involvement can be seen as an advantage since the consultancy offers support and assistance regarding the implementation; however, it generally means that the fee to be paid is larger and the organization is dependent upon the consultancy firm.

2.2.6.1 Summary

Four options have been described of complete frameworks and readymade SPP systems. The Zeffane and Mayo model and the SHARP framework are examples of complete SPP frameworks. Both these models have been created in the early 1990s and might therefore not be up-to-date or suitable in the current dynamic setting. In addition to these readymade frameworks, there are frameworks that have been developed by consultancy firms and complete software packages that can be used for

SPP. The benefit of these two options is that the instruments can be tailored to the needs of the organization. However, they often require a large payment to be made in order to use the instruments. To summarize, the following table describes the four options together with their advantages and disadvantages.

	Framework	Description	Advantages	Disadvantages
Complete Frameworks	Zeffane & Mayo model	Complete framework based on the Markov chains theory.	Readymade complete framework	Cannot be tailored towards the requirements of the organization; static model; only quantitative data.
	SHARP framework	Complete SPP framework for healthcare sector.	Readymade; specifically made for the healthcare sector.	Cannot be tailored towards the requirements of the organization; static model; only quantitative data; based on old (1994) computer model.
	Software packages	Software package containing all necessary instruments.	Can possible be tailored towards to needs of the organization; offer assistance and guidance.	Complicated; often mechanistic; require (large) payment.
	Frameworks & instruments developed by consultants	Complete frameworks developed by consultants	Tailored towards the requirements of the organization; receive support from consultant.	Require payment; require involvement of external organization (i.e. the consultancy firm).

Table 7 - Summary Preliminary SPP Framework - Complete Frameworks

2.3 Conclusion

Throughout the previous paragraphs, strategic personnel planning has been defined, followed by an enumeration of the different instruments that can be part of a SPP framework.

In short, strategic personnel planning involves determining the fit between the supply of and demand for personnel in the future to meet the organization's strategic objectives and cope with external contingencies and pressures. The SPP process consists of five steps: (1) portray the current workforce; (2) translate the current workforce into a prognosis of the personnel available in the future; (3) identify external forces and strategic objectives of the organization; (4) determine the future demand for personnel; and (5) compare the supply of personnel with the demand for personnel. The fit between the future supply of and demand for personnel can be overcome by means of, for example, HR policies regarding inflow, internal flow and development, and outflow.

By combining these five steps of the SPP process with definitions found in the literature, strategic personnel planning has, for the purpose of this report, been defined as the process of determining the quantity and quality of the future personnel required and the future personnel available in order to timely signal any differences between the supply and demand in the future, allowing an organization to implement HR policies with regard to the inflow, through flow, and outflow of personnel in order to effectively and efficiently allocate the workforce to meet the strategic objectives of the organization and cope with environmental contingencies and pressures.

In the theoretical background, an inventory has been made of the different instruments described in literature. It is remarkable to note that most of the instruments have been developed in the 1990s,

some of which are even based on methods developed in the late 1960s. This makes it important to treat the information with care; it cannot be assumed that the instruments are still valid and produce realistic results. There have been many developments over the past decades, from technological developments to organizational changes. For example, many of the instruments to estimate the future supply of personnel consist of complex mathematical equations that are static and mechanistic. These types of instruments might not be useful in today's dynamic and constantly changing environment.

The purpose of the current chapter was to gain knowledge regarding strategic personnel planning and identify different instruments that can be used for SPP. From the instruments described in the theoretical background, an initial selection will be made by considering the advantages and disadvantages of the instruments to determine which collection of instruments might be suitable for Medisch Spectrum Twente. This initial selection results in the development of the preliminary SPP framework for MST, which is described in Chapter 3. It must be kept in mind that the preliminary framework is merely based on the theoretical background. By means of interviews and a pilot implementation, the preliminary selection is adjusted and tailored to the requirements and needs of the organization.

3. TOWARDS A PRELIMINARY SPP FRAMEWORK

In the previous chapter, different methods and instruments have been described to portray the current workforce, estimate the supply of and demand for personnel in the future, and determine the fit between supply and demand. From the instruments described in the theoretical background, a preliminary selection can be made regarding the instruments that can be used to form a strategic personnel planning framework for Medisch Spectrum Twente. Initially, a selection will be made by means of a contingency approach. Besides, the advantages and disadvantages of the instruments, as described in the previous paragraphs, are taken into account during the selection procedure. The selection of the instruments is described in Section 3.1.

After selecting the instruments for the preliminary framework for MST, the working methods of the instruments will be described in more detail in Section 3.2. The preliminary selection of instruments is merely a sketch of which instruments could be included in the SPP framework for MST based on the theoretical background. By means of interviews and a pilot implementation, as described in Chapter 5 and 6 of the current report, the preliminary selection is tested based on its applicability, practicality, and usefulness in the current setting of MST.

3.1 Selection of Instruments

Sinclair (2004) notes that “although many approaches to workforce planning exist, the practicality of such approaches depends on how easily they can be implemented and the ease with which they can be tailored to the situation at hand” (p.8). Similarly, Evers and Verhoeven (1999) state that it is of vital importance that the overall SPP framework is as simple, uncomplicated, straightforward, and adaptable as possible. These points are in line with the critical success factors 3 and 4, as described in Section 1.5.3 of this report. First of all, collecting the necessary data should cost as little time as possible, especially considering the fact that certain factors can change at any moment in time, resulting in a shift in, for example, the demand for personnel in the future. It should be possible to incorporate these changes without too much hassle. In addition, if the SPP framework requires complex data which cannot be easily obtained, it is likely that the SPP framework will not fully be supported by managers or team leaders. Besides, managers of all organizational levels should be able to work with the instruments and view the results as valuable information, which stimulates the use and acceptance of the instruments. Thus all parties involved have to completely understand the instruments and their benefits, and the data required. Since these parties all have different (educational) backgrounds, functions, and skills, the instruments have to be simple to understand. “The simplest approach may be the best since [...] workforce plans have often failed through attempting to do too much” (Sinclair, 2004, p.8).

3.1.1 Contingency Approach for Strategic Personnel Planning

Geurts et al. (1996) mention that personnel planning is contingent upon the labour market structure, the organization’s configuration, and the type of mobility within the organization. The contingency approach adapted by Geurts et al. (1996) aims to distinguish between the need for different personnel planning methods in different circumstances and thereby assists in selecting instruments and methods for personnel planning that are best suitable for a specific organization. In other words,

the frequency and type of inflow, through flow, and outflow of personnel together with the openness of the borders between the internal and external labour market help determine which personnel planning instruments are best suitable for a specific organization. Based on these dimensions, Geurts et al. (1996) present the typology of 12 types of human resource planning. For example, for an organization with a configuration of a machine bureaucracy together with a craft labour market structure and up-or-out type of mobility, Geurts et al. (1996) suggest that the demand for personnel should be determined by means of trend or correlation equations and the supply of personnel can be determined by means of the Markov model. In addition, HRM tools suggested for such an organization include recruitment, promotion, and dismissal.

In order to determine which type of human resource planning instruments are, according to the contingency approach of Geurts et al (1996), most suitable for MST, the following paragraphs describe the labour market structure, the configuration of MST, and the type of mobility within the organization.

3.1.1.1 Labour Market Structure

The labour market structure indicates the type of knowledge and skills that are important, either firm-specific or general, and provides information regarding the availability of people on the internal labour market and the attractiveness of the external labour market. Geurts et al. (1996) distinguish between a primary labour market, including the internal labour market and crafts markets; and the secondary labour market which includes low rated and low paid jobs.

The labour market of MST is most consistent with the primary labour market. In an internal labour market, employees move between jobs internally by means of promotion and demotion. Although in general internal flows are preferred by MST, it is not always possible or most beneficial to fill a vacancy internally. The main characteristic of a crafts market is that the necessary (general) knowledge to fulfil certain tasks is obtained through formal education outside the organization, making it possible for employees to easily switch to another organization.

3.1.1.2 Organizational Configuration

An organization's configuration indicates the possibilities of internal flow between the hierarchies and divisions with regard to promotion and demotion. In addition, it indicates the type of personnel required. Medisch Spectrum Twente is a large organization with a flat horizontal structure with three hierarchical layers (see Appendix A for the organization chart). The organization is made up out of seven departments, each consisting of several different RVE (result oriented units) who have their own budget and are responsible for their own results.

Geurts et al. (1996) follow the configuration of organizations as described by Mintzberg in 1983, and define five configurations: (1) simple structure; (2) machine bureaucracy; (3) professional bureaucracy; (4) divisional structure; and (5) adhocracy. Of these configurations, MST can best be classified as a professional bureaucracy where highly educated professionals are responsible for the primary processes of the organization (i.e. healthcare).

3.1.1.3 Mobility

The type of mobility and career patterns give an impression of the flow patterns within an organization, thereby providing information regarding inflow, the type of internal flow, and the frequency of outflow. The mobility and personnel flows must be considered at the micro level of an organization where all mobility processes and personnel flows within all organizational parts are analyzed, in order to perform a detailed personnel planning (Evers & Verhoeven, 1999).

Geurts et al. (1996) describe three possible career patterns: (1) lifetime employment; (2) up-or-out; and (3) unstable in and out. However, neither of these individual career patterns fit with the current practices of MST. First of all, not all employees enter at the lowest level in the organization and move up through the organization, as is implied in the first two career patterns. The unstable in and out career pattern applies mainly to freelance employees who are hired when an organization needs them, and laid off when they are no longer needed. Thus, the career patterns at MST cannot be labelled as one of the three patterns described by Geurts et al. (1996); each of the patterns exists to some extent within the organization. The career patterns described by Geurts et al. (1996) are based on the typology of Beer, Spector, and Lawrence (1984), who add a fourth career pattern: the mixed pattern, which is a mixture of the other three patterns. Although Geurts et al. (1996) do not describe this fourth career pattern, it is most applicable to MST.

3.1.1.4 Conclusion

In the previous paragraphs it has been suggested that the type of instruments that are suitable for a particular organization's strategic personnel planning system is contingent upon the labour market structure, the organizational configuration, and the mobility and career patterns of that organization. This contingency approach can help determine which instruments are suitable to be included in the SPP framework for MST. Therefore, these three dimensions have been described above. To summarize, the labour market structure of MST can be classified as a primary labour market consisting both of properties of an internal labour market and a crafts market; the organizational configuration is that of a professional bureaucracy; and the mobility and career pattern is a mixture of lifetime employment, up-or-out, and unstable in and out.

Based on these characteristics, the following focus points for human resource planning can be suggested: long term planning; flow models; Markov chain (push) model; vacancy chain model; and aim to prevent loss of talents. With these focus points in mind, together with the advantages and disadvantages of the instruments as described in Chapter 2, a preliminary selection of the different SPP instruments can be made for MST.

3.1.2 Current Workforce

The starting point of strategic personnel planning consists of portraying the current workforce including the characteristics of the employees and the flow rates. As described in Chapter 2, the most accurate and straightforward method to compile the general information such as demographic details of the labour force is by means of a simple computer program, for example in a personnel information system or an advanced Excel sheet. It is likely that most of the information required has already been compiled in such a way that it can be used for personnel planning purposes. In addition to the general information regarding the personnel, data regarding inflow, internal flow, and outflow

needs to be portrayed in such a way that it can eventually be translated into a prognosis of the future supply of personnel.

Geurts et al. (1996) mention that it is important that instruments for personnel planning incorporate both quantitative and numerical facets as well as qualitative aspects: “the models must be of an organic nature and flexible type, adjustable to organizational dynamics” (p.11). Quantitative data regarding flow patterns can easily be compiled by means of the IDU-matrix, which provides a simple, numerical overview of inflow, internal flow, and outflow. In addition to quantitative data, qualitative information regarding performance and potential can be gathered by means of the HR3P-matrix or the Vlootschouw. Both the HR3P-matrix and the Vlootschouw require qualitative information provided by team managers. Although criteria are used to rate the current performance of the employees, the outcome of the instruments are rather subjective. The disadvantage of using the Vlootschouw for the current purpose is that this method has been designed by a consultant and thus payment is required to be able to use it. Since it is similar to the HR3P-matrix, which can be implemented free of charge, the HR3P will be selected for use in the current study. Should the HR3P-matrix prove to be insufficient, MST can decide to hire a consultant to develop a similar tool or use the Vlootschouw developed by Breeveld (2011).

The survivor-function method can be used to analyze the effectiveness of HR policies regarding recruitment, selection, and retention. Although this method can be used if it provides necessary input for a model used to determine the future supply of personnel, the method in itself does not provide essential information regarding personnel planning and will thus not be discussed further.

3.1.2.1 Summary

To portray the general characteristics of the current workforce, a personnel information system will be used since this is the most accurate and straightforward method. It is likely that MST already uses a personnel information system which can be used for SPP. To display the quantitative information regarding flows, the IDU-matrix will be included in the preliminary SPP framework. By simply displaying data regarding inflow, internal flow, and outflow, the IDU-matrix provides a clear overview of flows in a certain period of time. Finally, the HR3P-matrix is preferred over the Vlootschouw since the HR3P-matrix can be used free of charge while using the Vlootschouw requires payment to be made. Thus, the HR3P-matrix will be included to model the performance and potential of the current workforce. Although the outcome of the HR3P-matrix is rather subjective, the instrument and its outcomes are simple to understand. In addition, the matrix can be used for other purposes besides personnel planning, for example performance appraisal, which is likely to increase the support from users regarding the use of the instrument and SPP as a whole. The survivor-function method is excluded from the selection since the method in itself does not provide valuable input for SPP.

3.1.3 Supply of Personnel

The models described to estimate the future supply of personnel take the current labour force as a starting point since part of the personnel available in the future is currently employed. In Section 2.2.2, descriptive models have been described as instruments that can be used to translate the current workforce into a prognosis of the personnel available in the future.

Descriptive models including the Markov model, the semi-Markov model, the renewal model and combinations of these models are mechanistic, require a large amount of data and rely heavily on complex statistical equations. Although these models have frequently been used in the 1970s to determine both the supply of personnel as well as the demand for personnel, Evers and Verhoeven (1999) point out that these models alone are not suitable to be used in the modern-day unstable and ever-changing environment unless they are used simultaneously with other methods. Geurts et al. (1996) add to this that the classical manpower models ignore qualitative aspects such as performance and potential of employees. Nevertheless, when used in combination with a model to incorporate qualitative aspects in estimating the supply of personnel in the future, a descriptive model can be included to determine the quantity of personnel available in the future.

Models such as the renewal theory approach and the vacancy chain model can be effective instruments when the vacancies are filled internally, and filling a vacancy in one category automatically results in a vacancy in another category. As previously mentioned, MST strives to fill most positions internally; however, this is not always possible and personnel has to be hired externally. Therefore, predicting the future flow of personnel based on the assumption that personnel is pulled in a certain direction caused by vacancies does not provide a realistic view regarding internal flow. In addition, to complete both models, the demand for personnel must be known. The demand for personnel is discussed in a different section and mixing the two can lead to problems: since the demand for personnel cannot be forecasted with full certainty, using this forecast to determine the supply of personnel increases the chance of both predictions being inaccurate. Thus, although the use of these models in the current setting is advised by Geurts et al. (1996), due to their shortcomings they will not be incorporated in the SPP framework for MST.

The Markov model and the semi-Markov model, on the other hand, predict the future flow of personnel based on the assumption that personnel is pushed in a certain, known, direction. These models are best suitable for organizations where the demand for personnel in the future is uncertain. From these two, the Markov model is preferred since the semi-Markov model uses conditional transition probabilities. Even though including transition probabilities allows the model to be more flexible and adaptable to a specific situation, it also increases the complexity of the model and the input required.

Although the Markov model requires a large amount of data and has a mechanistic nature, the model can be used to translate data from the IDU-matrix regarding the current workforce into a prognosis of the supply of personnel by estimating how the internal flow and outflow are likely to evolve over the years. In addition, based on the description of the contingency dimensions described above, Geurts et al. (1996) advise the use of the Markov model for the current setting. However, an additional model must be incorporated to include qualitative aspects in estimating the supply of personnel in the future.

In addition to the Markov model, the P&P matrix can be used to model the quality of the future workforce. This matrix pays special attention to the performance and potential of employees and is therefore highly suitable for the current situation. Besides, this model is derived from the HR3P-matrix, which is being used to portray the current workforce. This makes it possible to use the same data to estimate the supply of personnel in the future. The P&P matrix is chosen over the HR3P-

matrix since the P&P matrix can be seen as a simplified representation of the outcome of the HR3P-matrix, making it simpler to understand and interpret the results.

The employee-object model is a complex version of a push-model combined with the HR3P-matrix. The main advantage the Markov (push) model has over the employee-object model is that it is simpler to interpret the results and it provides a clear representation of the expected flow. The HR3P-matrix can also be used for other purposes besides personnel planning (such as performance measurement). Therefore, the use of the Markov model and the HR3P-matrix is preferred and the employee-object model will not be used for the current SPP framework.

3.1.3.1 Summary

The current labour force forms the starting point from which the personnel available in the future can be estimated. The paragraphs above described the selection of the instruments to forecast the supply of personnel in the future. Pull-models and other models that assume that personnel is pulled in a certain direction caused by vacancies will not be included in the selection since they are unlikely to produce realistic results in the current setting of MST. A push-model such as the Markov chain or the semi-Markov model is more suitable for MST. From these two, the Markov model is preferred since the semi-Markov model uses conditional transition probabilities making the model more complex and more difficult to use compared to the Markov model. Input for the Markov model consists of data gathered by means of the IDU-matrix. The IDU-matrix has been selected to display information regarding the current workforce's flows, as described in Section 3.1.2., meaning that the input for the Markov model is already available. Thus, the Markov model merely needs to perform the necessary calculations. When these calculations are performed by means of a computer program or Excel sheet, completing the Markov model can be done in a short amount of time.

Due to the fact that the Markov model is a mechanistic and static instrument which merely considers quantitative data, the P&P matrix is added to the selection. The P&P matrix offers the possibility of determining the quality of personnel available in the future. In addition, the P&P matrix is derived from the HR3P-matrix, which has been selected to portray the quality of the current workforce meaning that the input for the P&P matrix will already be available.

3.1.4 External Environment & Corporate Strategy

The future demand for personnel is determined by the corporate strategy and the external factors influencing the organization and the labour market. Gathering and analyzing the necessary information can be difficult, especially if a person is not familiar with these types of issues. Therefore, it is important to use simple instruments and include the opinions of experts in the process. The latter can be done by means of qualitative methods such as the Delphi-method or the EFTE-method. These methods can be used to assess the external factors and identify relevant strategic objectives and their impact on the demand for personnel. The advantage the EFTE-method has over the Delphi-method is that it allows for a discussion between the participants, which is likely to increase the quality of the outcome and the possibility of a reaching an overall consensus. Therefore, the EFTE-method will be used in the SPP process for MST.

The strategic plans of the organization need to be translated into the area of human resources to provide guidelines regarding the demand for personnel. Although this can be a difficult process, the

data is vital in determining the demand for personnel. The most straightforward way of portraying the relevant strategic objectives is by displaying them in a simple and clear overview.

The external environment can be portrayed by means of a PEST analysis, or one of its variations such as STEP, PESTLE, or STEEP. Similar to the process of identifying the strategic objectives, portraying the external factors can be difficult. However, the PEST analysis structures the process and provides a clear overview of the external factors. After portraying the environmental factors, their influence can be ranked by means of the EFE matrix which helps determine which factors are most influential in establishing the requirements for the future workforce. The main threat to the EFE matrix is that the quality of the PEST analysis determines the quality of the outcomes of the EFE matrix. Therefore, it is recommended to include a qualitative method to gather expert's (e.g. managers) opinions in creating the PEST analysis and the EFE matrix.

3.1.4.1 Summary

Collecting and analyzing information regarding the external environment and the corporate strategy can be difficult. However, the information is essential in determining the demand for personnel in the future. Therefore, the instruments must be as simple and straightforward as possible and including the opinions of experts is necessary.

The external environment will be displayed in the form of a PEST analysis since this analysis provides a clear overview of key external factors. Next, the external factors are weighted by means of an EFE matrix based on the opinions of experts. The relevant parts of the corporate strategy will be displayed in a simple overview summarizing the main strategic objectives regarding human resources. In both these analysis, opinions of experts will be gathered by means of the EFTE-method.

3.1.5 Demand for Personnel

As described above, the demand for personnel in the future depends highly on changes in the external environment and the strategic objectives of the organization. The instruments described previously all consider different aspects when determining the demand for personnel. The instruments described in Section 2.2.4 include quantitative methods such as exploration models, correlation models, and the function-object model developed by Geerlings, Verbraeck, De Groot, et al. (2001); and qualitative methods including the EFTE-method and the Delphi-method.

Exploration methods only consider the factor time as a determinant for the future demand for personnel. Therefore, they do not provide a realistic perspective. Correlation methods on the other hand, are rather static in that they expect a direct relationship between one variable and another, which is often not the case in practice (Evers & Verhoeven, 1999). Therefore, these methods will not be included in the SPP framework for MST.

Since the exact influence of forces in the external environment is often uncertain, scenario planning can be used as a tool to explore the (combined) impact of different uncertainties. The main disadvantage of scenario planning is that the results can be difficult to interpret since many different outcomes are possible. However, scenario planning builds on the data gathered by means of the PEST analysis and the EFE matrix, and creates awareness regarding the impact of internal and external factors. Therefore, scenario planning will be incorporated in the SPP framework for MST.

The function-object model can be used to portray the current and desired occupation per function. However, this model works best when used in combination with the employee-object model and the matching-object model developed by Geerlings, Verbraeck, De Groot, et al. (2001). The function-object model alone does not provide a clear overview of the demand for personnel. Since the employee-object model will not be used to estimate the future supply of personnel, it is not worthwhile to include the function-object model in the SPP framework for MST.

However, it is essential to estimate the number of functions necessary in the future and the occupation needed per function. This information can be derived from the scenarios and the strategic objectives of the department. Portraying the information in a table will be sufficient for personnel planning purposes. This table will, throughout the remainder of this report, be referred to as the 'occupation table' and will be included in the framework for MST. The main purpose of the occupation table is to translate the consequences of the scenarios and the strategic objectives into a numerical representation of the personnel required in the future.

3.1.5.1 Summary

In order to determine the demand for personnel in the future, first scenario planning is used to explore the influence of internal and external factors. Based on the outcome of the EFE-matrix, the strategic objectives, and scenario planning, an estimation can be made regarding the demand for personnel in the future. This can be portrayed in the occupation table which specifies the required personnel per function. Throughout the process of determining the demand for personnel, the EFTE-method will be used to collect opinions of professionals.

3.1.6 Fit between Supply and Demand

After determining the future availability of personnel and the personnel required for the future, a comparison between the demand and supply needs to be made to determine whether there is a fit. In Section 2.2.5, two methods to determine the fit have been described: performing simple calculations and observations; and the matching-object model. The matching-object model requires input from both the employee-object as well as the function-object model. Since neither of these models has been incorporated in the SPP framework for MST, the matching-object cannot be used to determine the fit between the personnel available in the future and the future desired workforce. Therefore, the most straightforward and simplest method to use is to calculate the difference between the personnel available and the personnel required in the future and display the information in a simple table. The outcome will present areas upon which the organization should focus to create the workforce required in the future.

3.1.6.1 Summary

The fit table will be included in the preliminary framework for MST since this is the simplest method of calculating the difference between the supply of and demand for personnel in the future. The matching-object model cannot be included since it requires input from the employee-object and the function-object model, which have not been included in the preliminary framework for MST.

3.1.7 Complete Frameworks

Due to the complexity and differences between the departments within MST, the complete frameworks and readymade software packages described in Section 2.2.6 will not be included. These frameworks consist of fixed instruments which makes it difficult to tailor the instruments to the needs of the different departments. In addition, the instruments in the complete frameworks solely provide information focussing on personnel planning and can thus not easily be used for other purposes such as performance evaluation. This decreases the possibility of receiving full support from team leaders and managers since the benefits of the instruments decrease.

3.1.8 Summary

In the previous sections, a preliminary selection has been made based on the theoretical background. By considering the advantages and disadvantages of the instruments, the instruments that are according to the theoretical background most suitable to be used in the current setting of MST have been selected to be included in the preliminary SPP framework for MST. To summarize, the personnel information system will be used combined with the IDU-matrix to portray the characteristics and dynamics of the current workforce. The outcome of the IDU-matrix is transformed into a prognosis for the supply of personnel in the future by means of the Markov model. The P&P matrix is used to estimate the quality of the future supply of personnel. The influence of the external environment is analyzed by means of the PEST analysis and the EFE matrix; the relevant strategic objectives are highlighted and summarized. Here, the EFTE method can be used to include experts' opinions on the subject. Next, scenario planning is used to assess the combined impact of different internal and external factors. The outcome of the EFE matrix, the summary of the strategic objectives, and the outcome of scenario planning is translated into a prognosis of the future demand for personnel, which is summarized in the occupation table. Finally, the fit table is used to compare the supply prognosis with the demand prognosis. Actions (e.g. HR policies regarding inflow, internal flow, or outflow) can be taken to overcome the discrepancies between supply and demand. This process is illustrated in Figure 3.

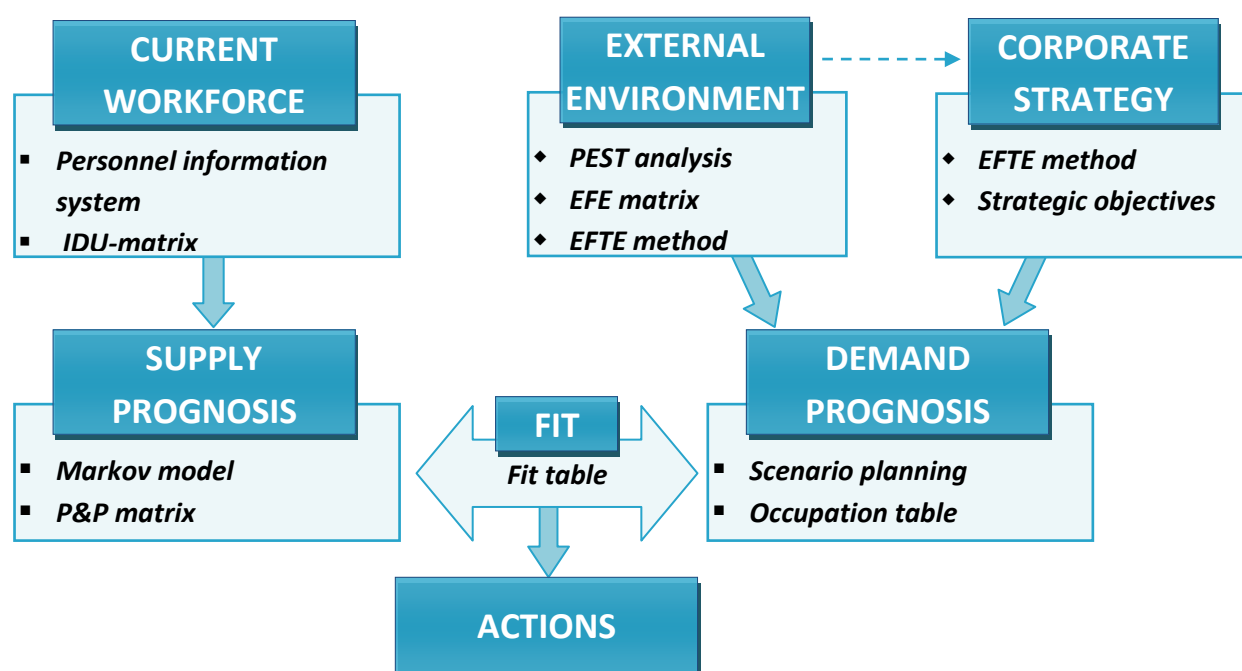


Figure 3 - Preliminary SPP Framework

3.2 Operationalization of the Preliminary SPP Framework

The preliminary framework, as described in the previous paragraphs, consists of an initial selection of instruments based on the theoretical background. In order to test whether these instruments work in practice, interviews will be conducted together with a pilot implementation. In order to obtain valuable and useful information during the interviews, it is first worthwhile to describe the instruments in more detail, which will be done in the following sections. The procedure of the instruments is described, along with the required input and desired output. In addition, suggestions are provided regarding who should be responsible for providing the input and using the instrument.

3.2.1 SPP Coordination

Prior to discussing the SPP instruments selected for MST, it is essential to determine who is responsible for the SPP coordination and at which level the instruments and the overall framework can be implemented.

3.2.1.1 Departments

In Chapter 1, the structure of MST has been described. To recall: the organization consists of 7 divisions managed by a business manager and a medical or staff manager. Each division consists of multiple RVE, which in turn consist of multiple departments. The departments are managed by team leaders: each team leader is responsible for one or more departments. As described in Chapter 1, the ideal situation for MST would be that each department conducts its own strategic personnel planning. Accordingly, the instruments that are part of the SPP framework concentrate on individual departments, rather than the organization as a whole.

3.2.1.2 SPP Process & Responsibility

The SPP instruments will be implemented on the departmental level. This means that the HRM policy department of MST provides the tools and instruments, while the team leader of each department within an RVE, together with the HR advisor and the business manager of the division, is responsible for using the SPP instruments.

After the SPP process is completed up to the point where the fit between the demand for and supply of personnel has been determined, the outcome is communicated back to the HRM department of MST who can take actions and implement or change the necessary policies to overcome the gap between supply and demand.

3.2.1.3 Categories

Most of the instruments used for strategic personnel planning require the workforce of the department to be divided into categories. To simplify the process, the categories are the same for each instrument. Since the categories can differ from one department to the other it is the responsibility of the team leader of the department to divide the workforce into categories that are most applicable to the department. For example, a clinical department can be divided into the following categories: (A) administrative personnel; (B) medical personnel with high level of education (university); (C) level 5 nurse (HBO education); (D) level 4 nurse (MBO education); (E) lower level nurse/carer. However, these categories can be different for the clinical and non clinical departments.

Therefore, prior to starting the SPP process, consensus needs to be reached concerning which categories to use.

3.2.2 Current Workforce

The current workforce within a department will be portrayed in terms of quantity by means of a personnel information system and the IDU-matrix. The quality of the current workforce will be portrayed by means of the HR3P-matrix. These instruments are used to provide an overview of the quantity and quality of the current workforce without any predictions or simulations.

3.2.2.1 Personnel Information System

To portray the general information of the current workforce of a department, a personnel information system or database is required.

➤ **Method**

The personnel information system can be any form of computer database where all information required is contained. Preferably, an existing database is used rather than transferring the data from one database to another. If it is not possible to use an existing database, the required information can be transferred into an Excel file. It is essential that the database offers the possibility to sort the employees, for example by FTE, age, or function, which makes it possible to split the workforce into categories required for further analysis.

➤ **Input**

The general information required for personnel planning consists, according to Evers and Verhoeven (1999), of the following:

- Demographic details of the workforce, including the name and/or personnel number of each employee, the date of birth, and the educational background;
- The number of employees, their function, and their position within the department or organization;
- The type of contract the employee has (e.g. part time or full time; temporary or permanent; flex or fixed), the full time equivalent (FTE), and the starting date (and, if applicable, the end date) of the contract.

➤ **Output**

The personnel information system provides an overview of the general information of the workforce. It portrays the characteristics of the current workforce and provides input for further SPP analysis and methods.

➤ **Responsible persons**

The data can be provided by the RVE controller of MST. This person has an overview of personnel information and should be able to provide the information necessary. In addition, it can be possible that the team leader of a department can extract the information him/herself from the database.

3.3.2.2 IDU-Matrix

By means of the IDU-matrix all inflow, internal flow, and outflow within a department during a certain period of time is portrayed numerically.

➤ Method

The IDU-matrix has the following layout:

	A	B	C	Outflow	Total (start) 2011
Cat. A					
Cat. B					
Cat. C					
Inflow					
Total (end) 2011					

Table 8 - IDU-Matrix based on Evers and Verhoeven (1999)

The IDU-matrix is to be constructed for each department separately in order to get a reliable overview of the flows within that department. Each department is divided into categories based on the level of the current function of employees, as described in Section 3.2.1. In some cases it might be worthwhile to complete the IDU-matrix per function group, for example when there are so many changes and flows in one function group that it distorts the outcome of the regular IDU-matrix.

In the layout above, the year 2011 has been selected as an example to describe the workings of the IDU-matrix.

Constructing an IDU-matrix consists of five steps (Evers & Verhoeven, 1999):

1. Fill out the start situation in the *Total* column on the right side of the matrix. Here, data regarding the number of personnel in each category on 01-01-2011 is inserted into the matrix.
2. Portray the number of outflow per category in the *Outflow* column.
3. Fill in the number of people that have flowed internally (i.e. promotion; demotion; transfer) between the categories into the nine squares on the top left corner of the matrix.
4. Indicate the quantity of the inflow (external) in the second to last row;
5. Calculate the end situation on 31-12-2011 by calculating the column totals.

➤ Input

The information required to construct the IDU-matrix consist of the flow details in the period under investigation. It is necessary to know per category (in one department):

- The total number of employees per category;
- The number of newly hired employees (inflow);
- The number of employees who have left the department (outflow);
- The number of employees who have been promoted or demoted from one category to another within the same department.

This information should be extracted from the personnel information system described above, or any other form of personnel database.

➤ **Output**

The output of the IDU-matrix is a completed matrix which provides a numerical overview of the flows in one category over a certain period of time. This matrix forms the basis upon which additional calculations can be made regarding the estimation of the future supply of personnel, which will be done by means of the Markov model.

➤ **Responsible persons**

The information needed to complete the IDU-matrix can be extracted from the personnel information system, which can be provided by the RVE controller of MST. The team leader is responsible for completing the IDU-matrix.

3.3.2.3 HR3P-Matrix

The HR3P-matrix will be used to portray the quality of the current workforce per department in terms of the employees' current performance and growth potential.

➤ **Method**

The Human Resources Performance Potential Portfolio (HR3P) method, developed by Evers, Van Laanen, and Sipkens in 1993 (as cited in Evers & Verhoeven, 1999) is a tool to portray the available quality of the workforce of a department in terms of the current performance and growth potential of the employees.

The HR3P-matrix has the following layout:

		Current performance				Total
		Insufficient	Sufficient	Good	Excellent	
Potential	Reached full potential	I	II	III	IV	
	Has potential to grow within current function	V	VI	VII	VIII	
	Can be promoted in the short term (2-3 years)	IX	X	XI	XII	
	Can be promoted now	XIII	XIV	XV	XVI	
Total						Σ

Table 9 - HR3P-Matrix based on Evers and Verhoeven (1999)

The HR3P-matrix is used per category per department and contains information regarding individual employees. Each employee is plotted in one of the sixteen squares of the matrix.

Constructing the matrix consists of the following steps:

1. Determine the current performance per employee based on performance criteria set in the employee's job description;
2. Determine the growth potential per employee, either in his/her current function or to another function;

3. Plot each employee in one of the sixteen squares in the matrix, based on the current performance and growth potential.
4. Complete the matrix by totalling the number of employees in each column and each row, which can be filled out in the bottom row and right column. In the bottom right cell, the total number of employees is inserted.

At the moment, these steps provide sufficient information regarding the current performance and potential of the workforce for personnel planning purposes. Should the matrix be used for the evaluation of the workforce upon which actions can be taken to increase the employees' performance, additional steps can be suggested such as determining whether there is an explanation for the low performance of employees in cells I, V, IX, and XII; and how to maintain the high potential employees in cells XI, XII, XV, and XVI.

➤ **Input**

In order to complete the HR3P-matrix, knowledge regarding the performance and potential of each employee is necessary. The HR3P-matrix is completed for each category of employees within a department (see Section 3.2.1 for a description of the categories) since this provides good connections with the other SPP instruments.

➤ **Output**

After completing the four steps as described above, the matrix provides an overview of the quality of the current workforce in terms of their performance and growth potential. This information provides the input for determining the quality of the future supply of personnel, which will be described later in this chapter.

➤ **Responsible persons**

The team leaders of each department are responsible for completing the HR3P-matrix. The team leaders work closest with the employees and are, in general, responsible for assessing the performance of the employees and performance appraisal.

3.2.3 Supply of Personnel

After portraying the quantity and quality of the current workforce, estimations can be made regarding the future supply of personnel by means of the Markov model and an adjusted HR3P-matrix. The Markov model is used to estimate the quantity of the future personnel available, the HR3P-matrix to estimate the quality. The future supply of personnel is estimated based on the trends in the current workforce, thus it portrays the future situation when the (HR) policies remain unchanged.

3.2.3.1 Markov Model

The Markov model, also known as a push-model, predicts the future flow of personnel in a department based on past flow trends and is used to portray the quantity of personnel available in the future. After completing the above described IDU-matrix, an Excel document makes the necessary calculations to complete the Markov model.

➤ Method

To use the Markov model, first the transition probability is calculated, which is the average chance that a person will move from one category to another over a period of time. The information collected by means of the IDU-matrix is used and transformed into percentages that illustrate the transition probability. The probability rate is calculated by dividing the number in the cells by the row total (displayed in the column on the right hand side of the IDU-matrix). If the information is available, it is useful to first calculate the transition probabilities for several years in the past to determine whether the predictions are accurate. With these probability rates, the future supply of personnel is calculated and inserted into the Markov model.

The layout of the Markov model is similar to that of the IDU-matrix, although the second to last row of the IDU-matrix, the inflow, is excluded since this is an outcome variable of the confrontation between the personnel available in the future and the future demand for personnel (Evers & Verhoeven, 1999).

	Start per 01-01-2012	Internal flow from B	Internal flow from C	Outflow	End per 31-12-2016
Cat. A					
Cat. B					
Cat. C					
Total					

Table 10 - Markov Model based on Evers and Verhoeven (1999)

In the first column of the Markov model the start situation is inserted. This information is taken from the last row of the IDU-matrix. To calculate the expected flows for multiple years, the results from the first year form the input for the second year; the results of the second year form the input for the third year; and so on. The transition probabilities remain the same. To keep an orderly overview, only the column for the start situation is presented in Table 10 above. Table 10 uses an example of 5 years; the numbers that will be displayed in the middle columns representing the flows are totals of the five years.

Although a large amount of calculations needs to be performed, they are not complicated. To speed up the process an Excel sheet or simple computer program can be used to perform the calculations and make the predictions.

➤ Input

The input for the Markov model consists of the IDU-matrix, constructed to portray the current workforce. Except from the information regarding inflow, all information provided in the IDU-matrix is used to complete the Markov model. The calculations required to complete the Markov model can be performed by an Excel document. After completing the IDU-matrix, the Excel document automatically makes the necessary calculations to complete the Markov model.

➤ **Output**

The output of the Markov model is an overview of the flows expected in the upcoming years, assuming there will be no changes in the current (HR) policy. It provides an impression of how many people are likely to still be working within each category after an X number of years.

➤ **Responsible persons**

After completing the IDU-matrix, no additional information is required. Since the Excel sheet can perform the necessary calculations, the team leader responsible for completing the IDU-matrix does not need to perform any additional actions to generate the Markov model.

3.2.3.2 P&P Matrix

The performance and potential (P&P-matrix) is derived from the HR3P-matrix, which has been described previously to model the performance and growth potential of the current workforce. With a few alterations the same information can be used to estimate the future supply of personnel.

➤ **Method**

To make a prognosis of the supply of personnel in the future, it is assumed that the HR-policies do not change. Therefore, the distribution of the number of employees in the P&P matrix is similar that of the current workforce. When portraying the current workforce, names or personnel numbers of the employees have been used to complete the matrix. To determine the future state of the workforce, it can be suggested to transform the names in the matrix into numbers, thus determining how many employees per category per department are in which of the sixteen cells. The reason for using numbers rather than names is that, although it is assumed that the policies do not change thus the number of people in each cell will remain similar; the individual people can change between cells. The HR3P-matrix will not be used to calculate the exact supply of personnel. Rather, it gives an impression of the bottlenecks and focus areas.

To simplify the HR3P-matrix, the sixteen cells can be grouped into four cells, similar to the growth-share matrix developed by the Boston Consulting Group. With some alterations the BCG-matrix can be used for performance and potential portfolio management. In fact, the HR3P-matrix developed by Evers, Van Laanen, and Sipkens is based on the BCG-matrix (Dijkstra, 2008). The categories used in the BCG-matrix are dogs, question marks, cash cows, and stars (David, 2007). The Vlootshouw developed by Breeveld (2011) takes a similar approach but uses the following categories: problem children, eager learners, solid citizens, and rising stars. These categories are more suitable for personnel portfolio management and will therefore be used in the following.

- **Problem children** – cell I, II, V, and VI – employees who perform insufficient or just sufficient and have a limited potential to grow.
- **Eager learners** – cell IX, X, XIII, and XIV – employees who currently perform below average but have a high potential to grow.

- **Solid citizens** – cells III, IV, VII, and VIII – employees who have a low potential to grow but are stable, loyal and hard working employees who are reliable and perform good or excellent in their current function.
- **Rising stars** – cells XI, XII, XI, and XII - employees that have a high potential to grow and perform good or excellent.

Figure 4 illustrates the performance and potential (P&P) matrix.

		Current performance	
		Low	High
Potential	Low	Problem Children	Solid Citizens
	High	Eager Learners	Rising Stars

Figure 4 - Performance & Potential (P&P) Matrix based on BCG-matrix, HR3P-matrix, and Vlootschouw

➤ Input

The input for the P&P matrix consists of the completed HR3P-matrix which has been used to portray the current workforce. Instead of using the names of employees, as has been done previously, the total number of employees in each cell will be counted and used in the P&P matrix. The matrix is completed for each category within a department individually.

➤ Output

After plotting the numbers of personnel into the grid, the problem areas and bottlenecks will be visible. Assuming there will not be any major changes in policies in the upcoming years, the distribution of people over the grid in the future will be similar to the distribution of the current workforce. Different HR strategies and actions can be suggested for each of the four categories. The demand for personnel in the future should be estimated first to determine where the focus should be. After establishing the fit between the demand and supply of personnel in the future, the outcome of the P&P matrix can be used to decide which categories are most important to concentrate on and which actions should be taken. In short, the rising stars are the high potential employees of the organization and should be retained; the solid citizens are hard working employees who should be maintained; and the eager learners should be stimulated and developed to grow into rising stars. The problem children should be analyzed in more detail to determine why they are underperforming and whether or not their performance and potential can be increased.

➤ Responsible persons

The team leader of each department is responsible for collecting performance and potential information regarding the individual employees (which has been collected by means of the HR3P-matrix used to portray the current workforce). This information can then be transformed by the team leader into the necessary input.

3.2.4 External Environment & Corporate Strategy

Before determining the future demand for personnel, the external environment needs to be analyzed along with the relevant aspects of the corporate strategy. The PEST analysis is used as a tool to portray the external environmental factors; the EFE matrix can be used to assess the importance of the different factors. The EFE matrix makes use of the EFTE-method to discuss the influence of the factors on the different departments of the organization. Similarly, determining which strategic objectives are important for each department can also be done by means of the EFTE-method.

3.2.4.1 PEST Analysis

The PEST analysis is used to portray the influential external factors. As previously described, these factors have been considered in the development of the corporate strategy. However, strategic personnel planning is to be performed at least once a year. Since the corporate strategy is adjusted every 3 to 5 years, when performing SPP the external factors and their influence can change compared to those considered in the corporate strategy. In addition, it is worthwhile to consider the external factors and their influence on the departmental level rather than the organizational level to analyze the impact of external forces on the individual departments.

➤ **Method**

The PEST analysis is a tool to portray the influential external factors. It is used to describe the political, economic, socio-cultural, and technological factors effecting the organization. To perform a PEST analysis, the external environment is analyzed and the factors affecting the department of the organization are listed. Special attention must be paid to factors that influence the human resources of the department.

➤ **Input**

The input for the PEST analysis consists of available data and information concerning the external environment.

➤ **Output**

The output of a PEST analysis is an overview of the external factors influencing a department and its labour market.

➤ **Responsible persons**

General information regarding the external environment can be collected by the team leader and the business manager of a department.

3.2.4.2 EFTE-Method

The EFTE-method is a qualitative method for collecting opinions of individual managers and professionals. The method can be used throughout the SPP process, for example to gather opinions regarding the importance of external factors, but also to highlight aspects of the corporate strategy.

➤ **Method**

The steps of the EFTE-method consist of: Estimate, Feedback, Talk, and Estimate. To use the EFTE-method, first the opinions of individual professionals are collected by means of a simple interview, a short meeting, or a short open-ended questionnaire. By doing so, each

participant's opinion is included in the analysis. After collecting the opinions, they are anonymously and randomly distributed among the participating professionals. Next, all participants discuss the different opinions in a group discussion or meeting, after which each participant can change his or her initial opinion.

➤ **Input**

The information required as input consists of a questionnaire, or interview protocol to be used to gather the opinions. In addition, knowledge on the subject in question is necessary. If, for example, the EFTE-method is used to determine the importance of external factors, it is useful to first overview the influential factors by means of a PEST analysis. Similarly, when the EFTE-method is used to collect opinions regarding strategic plans, the relevant aspects of the strategic plans can be summarized beforehand.

➤ **Output**

Ideally, the output of the EFTE-method consists of a convergence in the opinions of professionals, by which an impression of the subject in question is gained.

➤ **Responsible persons**

The team leader can be responsible for organizing and managing the EFTE meeting. In addition, the business manager and other professionals can be the professionals to provide their opinions.

3.2.4.3 EFE Matrix

The external factor evaluation (EFE) matrix is a tool that can be used to evaluation the importance and influence of external factors (David, 2007) and can be used after the PEST analysis is completed.

➤ **Method**

After listing the key external factors by means of a PEST analysis, the factors can be weighted and rated based on their importance for an individual department.

KEY EXTERNAL FACTORS		Weight	Rating	Weighted score
Opportunities				
1.				
2.				
3.				
...				
Threats				
1.				
2.				
3.				
...				
Total		1,00		

Table 11 - External Factor Evaluation Matrix based on David (2007)

Completing the EFE matrix consists of five steps.

1. List the key external factors, including both opportunities and threats that have a direct or indirect effect on the human resources of the department.
2. Assign a weight to each factor representing the relative influence of each factor to the human resources of the department. The weights range from 0.0 (no influence) to 1.0 (extremely influential). The previously described EFTE-method, or a simple brainstorming session, can be used to determine what weight to assign to each factor.
3. The next step consists of assigning ratings to each external factor indicating how effectively the department is currently responding to the factors, in other words, how well the current workforce of the department is coping with the external factors. The ratings range from 1 to 4 where 1 indicates that the department is responding superiorly to the external factor; 2 indicates a response above average; 3 indicates an average response; and 4 indicates that the department is poorly responding to the factor, meaning that the current workforce of the department is not capable of coping with the environmental factor.
4. By multiplying the weight of each factor by its rating, the weighted score can be calculated.
5. The sum of the weighted scores of all variables give the total weighted score of the department where 1 is the best possible score, indicating that the department is responding in an exceptional way to external influences. A score of 4 is the lowest possible weighted score and indicates that the current workforce of the department is not capable of coping with the environmental contingencies.

In general, the purpose of the EFE matrix is to assess the effectiveness of the organization's current strategy. For the current purpose, the EFE matrix can be used to determine the effectiveness of the current workforce of a department in coping with the external factors and point out issues that need attention.

➤ **Input**

The input required to perform the EFE matrix consists on the one hand of the output of the PEST analysis, and on the other hand of the opinions of professionals. The latter can be collected by means of interviews, meetings, brainstorm sessions, and the EFTE-method.

➤ **Output**

The output of the EFE matrix consists of an overview of external factors along with their relative importance to the human resources of the department. In addition, focus points will be indicated by means of the weighted scores. These provide the input for developing scenarios, which will be described in Section 3.2.5.

➤ **Responsible persons**

The team leader is most suitable to construct the EFE matrix, together with the business manager and HR advisor who can provide input and his/her opinion.

3.2.4.4 Strategic Plans

The strategic plans and objectives of the organization and the must be known and the aspects relevant for each department regarding personnel planning must be identified.

➤ **Method**

Whenever there is a strategic plan tailored to the individual department available, this should be used to provide the guidelines. If this is not available, the corporate strategic plans need to be summarized. Identifying the relevant strategic objectives can be done by means of a brainstorm session or the EFTE-method to incorporate the opinions of professionals (i.e. managers and team leaders).

➤ **Input**

The corporate strategy and/or strategic plans of the individual department form the input for selecting relevant objectives.

➤ **Output**

The required output consists of a simple summary of the strategic objectives relevant for personnel planning, together with a brief description on how to reach the objectives.

➤ **Responsible persons**

To collect information regarding the corporate strategy and strategic plans of the individual department the business manager, HR advisor, and team leader should be incorporated in the process.

3.2.5 Demand for Personnel

The demand for personnel cannot be forecasted with complete certainty since it depends on relative uncertain estimations regarding future states and changes. However, the following tools can provide guidance and highlight important aspects to be considered when determining the demand for personnel.

Scenario planning is used to determine the impact of the external factors, guided by the strategic objectives of the departments; the occupation table translates the strategic objectives and scenarios into the demand for personnel per category.

3.2.5.1 Scenario Planning

Scenario planning can be used as a tool to explore the impact of different environmental factors on the human resources of a department. “Each scenario takes the form of a carefully plotted narrative that examines a unique combination of conditions” (Schwartz & Ogilvy, 1998, p.57). The strategic objectives of the organization provide guidelines regarding the importance of the forces.

➤ **Method**

To use scenario planning, the influential external factors must first be identified along with the strategic objectives of the individual departments, the tools for which have been described in the previous sections.

According to Schwartz and Ogilvy (1998), plotting, or developing, scenarios can best be done in a team of different people through one or more interactive meetings or workshops. Developing scenarios can be done in several steps, as described by Schwartz and Ogilvy (1998):

1. Based on the outcome of the EFE matrix, the key factors that seem inevitable and unlikely to vary in the scenarios must be identified as the relatively certain facts (Schoemaker, 1995; Schwartz & Ogilvy, 1998). In addition, the forces that are most likely to have a significant impact (the highest weighted scores in the EFE matrix) have to be identified.
2. Next, the starting positions of the different scenarios have to be determined, which can be done inductively which requires a group of people to have multiple conversations or brainstorm sessions until a consensus is reached; or deductively, where priorities are set based on the two most critical uncertainties.
3. After determining the starting positions, the scenarios need to be filled in. Schwartz and Ogilvy (1998) refer to this as fleshing out the scenario plots. Schwartz and Ogilvy (1998) describe three tools for this:
 - a. systems thinking - explore the underlying patterns of the different forces and think systematically about the interaction of the driving forces;
 - b. building narratives – create stories (with a beginning, middle, and end) around the different forces and the impact they are expected to have;
 - c. characters – identify the driving forces behind the scenarios.

By completing the steps above, different scenario plots can be created. Figure 5 provides a simple example of a completed scenario plot consisting of four scenarios. In the example, the two key factors that are likely to have a significant impact are the use of technology (e.g. equipment or machines) and costs savings. After inserting these two factors on the ends of the grid, the effects of the key factors on the demand for personnel can be plotted.

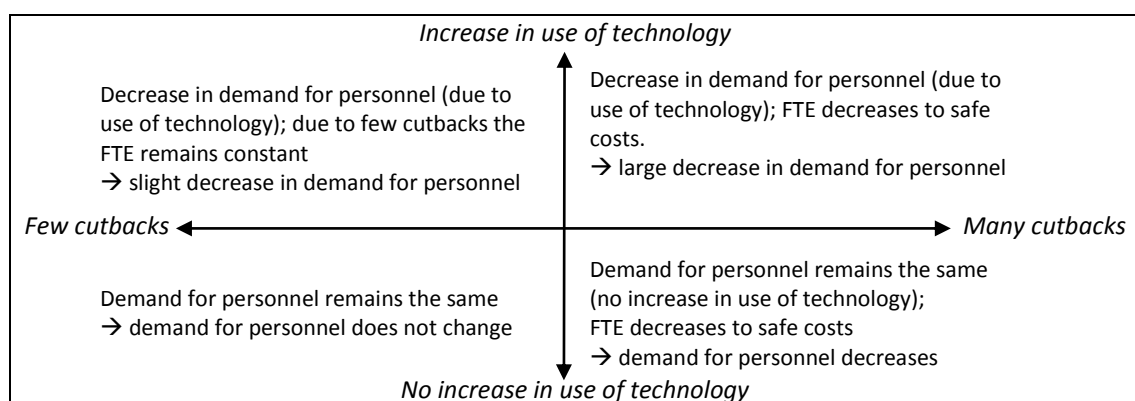


Figure 5 - Example Scenario Plot

➤ Input

Before the scenarios can be developed, the EFE matrix must be constructed and the strategic objectives must be identified, which have been described in the previous sections. The outcome of the EFE matrix and the description of the strategic objectives form the input for developing scenarios. In addition, input and collaboration of professionals is necessary for the development of the scenarios.

➤ **Output**

The different scenarios derived from the scenario plot form the output. The scenarios portray different possible futures taking into account inevitable and influential external forces guided by the department's strategic direction. There is no set number of scenarios required, it depends on the number of influential external forces how many scenarios are possible and necessary. As previously mentioned the scenarios do not forecast the future, they are rather like hypotheses of different possible futures and can be used to highlight opportunities and focus points regarding the personnel required in the future.

➤ **Responsible persons**

The overall session for developing scenarios should be managed by the team leader. In addition, managers, HR advisors and other professionals should be incorporated in the session. With their experiences, expertise, and knowledge regarding the external environment they should be able to construct the scenarios. Besides, Schwartz and Ogilvy (1998) mention that it is important to involve managers in developing scenarios since this increases the likelihood that "they will recognize the important but less obvious implications of these alternative worlds" (p.57) and increases their awareness regarding the influence of external factors.

Another possibility is to combine the scenario planning activities of different departments within an RVE. In that case, the business manager of the RVE manages the session and team leaders and professionals of all departments within that RVE participate in the session. Combining different departments into one session is only feasible when there are a limited number of departments within an RVE and the individual departments face similar external threats and opportunities and have similar strategic objectives.

3.2.5.2 Occupation Table

The occupation table will be used to portray the necessary occupation per category based on the strategic plans of the department and the developed scenarios. The main purpose of the occupation table is to translate the strategic objectives and scenarios into a numerical representation of personnel needed per category in the future.

➤ **Method**

To complete the occupation table, the number of employees necessary per category must be identified. This information can be extracted from the strategic objectives of the organization combined with the scenarios. The occupation table has the following layout:

Function category	Future demand (in number of personnel)
Category A	
Category B	
Category C	
Category D	
Category ...	
Total	

Table 12 - Occupation Table

The categories consist of the same categories used throughout this chapter (see Section 3.2.1 for a description of the categories).

➤ **Input**

The basis for the occupation table consists of the strategic objectives of the department and the developed scenarios. The strategic plans such as plans to reorganize, specialize, or downsize, specify how many employees are needed for per function. In addition, the scenarios developed based on the key external factors must be taken into account.

➤ **Output**

The occupation table indicates the employees needed to occupy a category in the future. The completed occupation table forms the input of the fit table used to determine the fit between supply and demand, which will be described in the next section.

➤ **Responsible persons**

The team leaders together with business managers and/or HR advisors are responsible for providing information regarding the necessary occupation of the categories and completing the occupation table.

3.2.6 Fit between Supply and Demand

The final step of the SPP framework consists of determining the fit between the future supply of personnel and the future demand for personnel, which can be done by means of a table.

3.2.6.1 Fit Table

The main purpose of strategic personnel planning consists of determining whether the workforce available in the future is sufficient to meet the future demand. After determining the personnel required in the future and the personnel available in the future, a simple table can be made to calculate the fit between supply and demand.

➤ **Method**

The fit table is completed for each department individually based on the prognosis regarding the supply of personnel on the one hand, and a prognosis of the future demand for personnel on the other hand. The *fit* column is completed by calculating the difference between the future supply of personnel and the future demand for personnel. The layout of the fit table is shown in the table below.

Function category	Future supply (in number of personnel)	Future demand (in number of personnel)	Fit
Category A			
Category B			
Category C			
Category D			
Category ...			
Total			

Table 13 - Fit Table

After completing the fit table, the HR3P matrix used to estimate the future supply of personnel can be used to make an initial estimation of how to overcome the gap between supply and demand by suggesting possible internal flows. The HR3P matrix can be used to illustrate which employees can be promoted (or demoted) to another category.

➤ **Input**

To determine the fit between the supply of and demand for personnel in the future, the necessary input consists of a prognosis regarding the supply of personnel on the one hand and a prognosis of the future demand for personnel on the other hand. More specifically, the input for the *future supply* column consists of the output of the Markov model (the *end total* column in the Markov model). The input for the *future demand* column consists of the outcome of the occupation table (the *future demand* column in the occupation table).

➤ **Output**

Determining the fit between demand and supply results in the final outcome of the SPP process. After completing the *future supply* and *future demand* column, the difference between those columns is calculated and inserted in the *fit* column. The numbers in the *fit* column represent the shortage or excess of personnel per category. It must be kept in mind that these numbers can only be seen as an indication since they are based on estimations. The outcome is an overview and indication of possible problem areas and focus points that provide guidelines on which (HR) actions can be taken regarding, for example, inflow, internal flow, or outflow. Thus, the outcome of the fit table must be communicated to the HRM department of the organization.

➤ **Responsible persons**

The team leader together with the HR advisor is responsible for completing the fit table.

3.2.7 Summary

The instruments that have been selected to be part of the preliminary SPP framework for MST have been described in detail in the previous sections. In order to refine the preliminary selection and determine whether the instruments are suitable to be used by MST, it is necessary to establish whether the input can be provided and whether the person responsible for working with the instrument is able to do so. Therefore, throughout the previous sections special emphasis has been placed upon the necessary input, the produced output, and the responsible persons. To summarize, Table 14 provides an overview of the instruments, the input required per instrument and the output generated by the instruments. In addition, the persons involved in the implementation of the instrument are marked.

Section	Instrument	Input	Output	Responsible Persons		
				Team leader	Business manager	HR advisor
Current Workforce	Personnel Information System	General personnel information	Overview general information of all employees in a department	X		
	IDU-matrix	Flow information to be extracted from personnel information system:	Numerical overview of flows in a department	X		
	HR3P-matrix	Current performance & growth potential per employee per category	Overview of performance and potential of the workforce per category per department	X		
Supply Prognosis	Markov model	IDU-matrix	Overview of flows expected in upcoming years	X		
	P&P matrix	HR3P-matrix of current workforce	Bottlenecks and problem areas regarding the quality of personnel which suggest internal flow possibilities	X		
External Environment & Corporate Strategy	PEST analysis	Data concerning external factors (political, economic, socio-cultural, technological factors)	Overview of external factors	X	X	
	EFTE-method	Interview/questionnaire; knowledge on topic	Opinion of professionals; impression of the subject in question	X	X	
	EFE matrix	PEST analysis & EFTE-method	Overview of external factors and their importance to the human resource of a department	X	X	X
	Strategic plans	corporate strategy & department's strategic objectives; EFTE	Summary of department's strategic objectives relevant for personnel planning	X	X	X
Demand Prognosis	Scenario planning	EFE matrix & department's strategic objectives	Scenarios	X	X	X
	Occupation table	Strategic objectives of the department & scenarios	Overview of personnel required in the future	X	X	X
Fit	Fit table	Markov model & occupation table	Fit between supply and demand in the future	X		X

Table 14 - Overview Operationalization of SPP Instruments – Preliminary SPP Framework

3.3 Conclusion

In Chapter 2, an enumeration has been made of different instruments that can be used for strategic personnel planning. Different instruments can be used to complete a certain part of the SPP process. Each instrument has its benefits and disadvantages and not every instrument is suitable for each setting. To create a SPP framework for MST, the instruments that appear to be most suitable for MST have to be selected from the assortment of instruments outlined in the theoretical background. The purpose of Chapter 3 was to make an initial selection from the instruments identified in Chapter 2. To guide this selection, a contingency approach was used. Next, based on the contingency approach and the knowledge regarding the advantages and disadvantages of the instruments, as specified in the theoretical background, an initial selection of instruments was made. The instruments included in the preliminary selection are, based on the theoretical background, believed to be suitable to be used by MST. The instruments of which the disadvantages are too great or the implementation of the instruments is unlikely to be feasible within the current setting of MST have been omitted from the preliminary selection.

This preliminary selection is merely made based on theoretical information, meaning that the selected instruments might not yield the desired results when used in practice. Therefore, to determine whether the selected instruments are in fact suitable to be used in practice in the current setting of MST, interviews will be conducted followed by a small scale pilot implementation to test the preliminary framework and make adjustments if necessary. If, for example, the interviews show that the input for one or more of the preliminary selected instruments cannot be obtained, it must be assessed whether another instrument can be used. Similarly, if data regarding, for example, the current workforce is already gathered by means of a different instrument, it must be determined whether the available data can be transformed into the necessary input in order to use the selected instruments, or whether the selected instrument can be omitted and the currently used instrument can be used instead.

Since the main purpose of the interviews is to determine whether the preliminary selection of instruments can be included in the final SPP framework for MST, the selected instruments form the basis for the topics to be covered during the interviews. Therefore, the instruments and their working procedures have been described in detail in Chapter 3.2.

In the following chapter, the research approach will be described including the data collection methods that will be used to assess the usability of the preliminary SPP framework.

4. METHODOLOGY

In Chapter 2, different instruments and models for strategic personnel planning have been described based on relevant literature, thereby answering sub-question 1. Based on the theoretical background, a preliminary SPP framework for MST has been developed in Chapter 3. Since the preliminary SPP framework consists of instruments that have been selected based solely on the theoretical background, it is important to determine whether the SPP framework and its instruments work in practice at MST.

This chapter describes the research approach that will be used to determine to what extent the selected instruments are useful and applicable within the current setting of MST, thereby answering sub-question 2. In addition, the results of all data collections and the theoretical background combined provide the input for answering sub-question 3. This has been illustrated by the dotted arrows in the research framework in Chapter 1 (see Figure 1).

4.1 *Research Approach*

In order to gain a rich understanding of the organization to determine which SPP instruments are best suitable, a case study strategy is used focussing on a single case: Medisch Spectrum Twente. Robson (as cited in Saunders, Lewis, & Thornhill, 2007) defines the case study strategy as “a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence” (p.139). Here, strategic personnel planning is considered the contemporary phenomenon and Medisch Spectrum Twente is the real life context of the phenomenon. Since the phenomenon is studied at a particular point in time in the context of the organization MST, the current research can be regarded as a cross-sectional study (Saunders et al., 2007).

Saunders et al. (2007) point out that a case study strategy is particularly useful to gain a deep understanding of the context (i.e. MST) and the processes (i.e. strategic personnel planning) under investigation. Gaining a deep understanding “can be advantageous during a research project aimed at changing an existing situation” (Verschuren & Doorewaard, 2010, p.184). In addition, Verschuren and Doorewaard (2010) mention that a case study approach has an advantage in practice-oriented research since it increases acceptance from people within the organization. Acceptance of the SPP system is closely related to recognisability and support, two of the critical success factors of the current research as described in Chapter 1. The main disadvantage of a case study research strategy is that the external validity is rather low, more specifically: the results are difficult to generalize since only one case is studied (Verschuren & Doorewaard, 2010). However, since the current research aims to develop a SPP system for one organization, generalizing the results is of less importance.

The data collection technique used frequently in case study research is a qualitative interview (Babbie, 2010). A qualitative, or semi-structured, interview is a data collection method used to collect in-depth knowledge (Saunders et al., 2007). According to Saunders et al. (2007) “the value of using non-standardized interviews is derived from the flexibility that you may use to explore the complexity of the topic” (p.319). In addition to the semi-structured interview, the focus group

method is a qualitative method often used in a case study approach. The focus group method, also known as group interviewing, is similar to the semi-structured interview method in that it uses semi-structured questions (Van Aken, 2010). The difference between the two is that there is one person being interviewed in the qualitative interview method, whereas there are multiple people, or a group of people, being interviewed in the focus group method (Babbie, 2010). Saunders et al. (2007) define the term focus group as “those group interviews where the topic is defined clearly and precisely and there is a focus on enabling and recording interactive discussion between participants” (p.337).

To determine which SPP instruments are best suitable for MST, in-depth qualitative information is required. Qualitative data has been obtained through semi-structured interviews and a group interview after a pilot implementation. First, qualitative interviews with end-users of the instruments were conducted. The purpose of these interviews was on the one hand to determine what information can be provided as input for the different SPP instruments; on the other hand the interviews were used to assess stakeholders’ opinions with regard to the use of the instruments and strategic personnel planning as a whole. In addition to interviews with end-users, semi-structured interviews were conducted with HR personnel of two other hospitals: one hospital where strategic personnel planning has been implemented; and one hospital that is currently in the process of starting the implementation of SPP. The aim of these interviews was to collect information and advice regarding the implementation and use of different instruments. Based on the outcomes of the interviews, the preliminary SPP framework has been refined. Next, the refined SPP framework was tested on its usability and practicality by means of a small-scale pilot implementation. The experiences of participants in working with the instruments were discussed during a group interview, based on the focus group method. The outcomes of the group interview formed the basis upon which the final SPP framework is developed and recommendations regarding the implementation of the framework are formulated.

MST is an organization located in the Netherlands and the working language is Dutch. To avoid misunderstandings and misinterpretations during the interviews, all interviews, meetings, and communication with the respondents has been in Dutch. Throughout the report, the results will be summarized in English. The original documents in Dutch regarding the data collection (e.g. e-mail; interview protocols) can be found in the appendices.

4.2 Sampling Methods & Data Collection Techniques

As mentioned above, the data collection techniques used in the current study include interviews with stakeholders, interviews with other hospitals, and a group interview based on a pilot implementation. These methods will be described in more detail in the following paragraphs. For each data collection method, first the techniques used to select participants to partake in the study will be discussed followed by the procedures used to collect the necessary data.

4.2.1 Interviews with Stakeholders

The first step in collecting the necessary data consisted of conducting interviews with the end-users of the SPP instruments. The purpose of these interviews was to explore the views and requirements of the end-users of the framework, along with determining what information and data is already available to be used for SPP and whether or not the data required can easily be obtained. Three

types of end-users were interviewed: an RVE controller, business managers, and team leaders. The opinion of these people is highly important since they will ultimately be working with the instruments. To recall: MST has a flat organizational structure with a small span of control. There are currently 7 clinical divisions, each consisting of multiple result oriented units (RVE), which in turn consist of multiple departments. The divisions are managed by a business manager and a medical manager; the team leaders are responsible for managing the departments. Interviewing both team leaders as well as business managers of different departments within the organisation allows for the responses to be cross-compared to determine whether there is a difference in responses between, for example, team leaders and business managers, or between business managers, or different team leaders.

4.2.1.1 Selection Procedures – Interviews with Stakeholders

Since different types of end-users were interviewed, different selection procedures were used. These selection techniques will be described per type of end-user in the following paragraphs.

RVE Controller

First, an interview with the RVE controller was held. Each RVE has its own (financial-) controller. In addition, there is one central RVE controller who has the broad overview of all HR related aspects of the different RVEs. The latter was invited to participate in the current research since this person is most likely to have access to the necessary information. Since there is only one RVE controller responsible for HR aspects, a selection procedure is unnecessary.

Business Managers

There are seven clinical divisions, each managed by a business manager. However, at the moment of selecting participants there was one vacancy, thus the total number of clinical business managers within MST to participate in the study was six. It is possible to collect data from all business managers; however, the business managers had to be available for the interview (i.e. not on holiday) and willing to participate in order to increase the quality of the input they provide. Therefore, self-selection sampling was used to select participants for the interviews. Self-selection sampling is a sampling technique where individuals are invited to participate in the research after which each individual is free to decide to take part or not (Saunders et al., 2007). To increase the variation of the answers and the validity of the research, a minimum of two business managers was required to partake in the qualitative interviews. Managers of the staff departments (e.g. the HRM department and PR department) have not been included since the main problem (as specified in the problem definition in Section 1.4) concerns medical personnel.

To invite business managers to partake in the study an e-mail was sent to all business managers of MST by the HR manager of MST. A document was attached to the e-mail providing more details on the study and the request to take part in the interview. The benefit of inviting respondents via the HR manager is that it is likely that business managers respond more favourable to an invitation from another manager compared to an invitation from a student. Hence, this technique of inviting respondents was chosen to increase the response rate.

Initially, all six business managers agreed to partake in the study. However, after scheduling the interviews it turned out that two business managers were on holiday during the time allocated for

the interviews. As a result, in total four business managers were interviewed, which equals 67% of all business managers within MST.

Team Leaders

Selecting team leaders to participate in the study is more complex compared to selecting the business managers. There are close to 100 team leaders within MST, making it unfeasible within the time constraint of this study to collect data from all individual team leaders. In order to select team leaders who are willing to participate and can provide valuable input, the business managers have been asked to identify two to four team leaders who could be invited to participate. This sampling method can be seen as a form of purposive or judgemental sampling: “a type of nonprobability sampling in which the units to be observed are selected on the basis of the researcher’s judgment about which ones will be the most useful or representative” (Babbie, 2010, p.193).

A minimum of six team leaders from at least two different divisions was required to ensure a variation in answers and increase the validity of the research. Including personnel from different departments allows for the responses to be compared and different perspectives are likely to emerge (Van Aken, 2010). In total, eight team leaders of four different divisions were interviewed.

4.2.1.2 Data Collection Procedures – Interviews with Stakeholders

After the participants had been selected, an e-mail was sent to each participant inviting them for the interview on a specific day and time. The respondent could, if necessary, suggest another moment in time for the interview in case the suggested date was inconvenient.

The interviews were administered face-to-face and were semi-structured, meaning that a list of specific topics was used while leaving sufficient room for addition information. Using semi-structured interviews with open-ended questions stimulates respondents to provide additional information and clarify their answers (Babbie, 2010). In addition, open-ended questions can help avoid bias and thus increase the reliability of the information obtained (Saunders et al., 2007).

The purpose of the interviews was two-fold: on the one hand the interviews aimed to explore the opinions and requirements of the end-users regarding the instruments and SPP as a whole; on the other hand the interviews aimed at determining which data could be provided as input for the SPP instruments. The detail description of the instruments as provided in Chapter 3.2 provided the guidelines for the topics to be covered during the interviews. Since different people were interviewed, with different responsibilities and positions within the organization, it was neither possible nor desirable to use a standardized set of questions for each respondent. Therefore, different interview protocols were used. For example, during the interview with the RVE controller, the main goal was to determine which data is available and in what format. Therefore, questions such as: *Which personnel information system is currently being used by MST?*; *What information is available in the personnel information system?*; and *Who has access to the information in the system?* were asked. The interviews with business managers and team leaders were more extensive. These interviews covered all areas of SPP and focussed on current practices as well as possibilities regarding the selected instruments. Questions asked during the interviews with business managers and team leaders included: *What information is available regarding your current workforce?*; *Do you create strategic plans and objectives for your division based on the corporate strategy?*; *Do you*

monitor what quantity and quality of personnel you need in the future?; and Do you think that, based on an analysis of external factors and the strategic objectives of the departments, it would be possible to determine the demand for personnel in the future?. The complete interview protocols can be found in Appendix B. These protocols merely served as guidelines during the interview; the questions and topics covered varied from interview to interview depending on the context and circumstances. Not all questions were relevant for each respondent meaning that some questions were omitted in a particular interview, while additional questions or probing questions were added in another interview. For example, during the interviews held with team leaders more focus was placed on the availability of information regarding the current workforce; while during the interviews with business managers the focus was on estimating the future demand for personnel. In addition, the order of the questions varied depending on the flow of the conversation.

Throughout the entire process of collecting data, anonymity of the respondents has been ensured. Although the nature of the questions is not necessarily regarded as sensitive, anonymity and confidentiality was ensured to gain the interviewee's trust and confidence and stimulate respondents to provide realistic and unbiased answers.

4.2.2 Interview with Santeon Hospitals

In addition to conducting interviews with the end-users of the SPP instruments, interviews with HR employees of two other hospitals were held where strategic personnel planning has been implemented. The purpose of these interviews was to gain knowledge regarding the experiences the organizations have had with the development and implementation of SPP, discuss practicalities and pitfalls, and discuss which instruments they are using and why they chose to include those instruments.

4.2.2.1 Selection Procedure – Interview with Santeon Hospitals

The hospitals were selected by the HRM manager of MST. Medisch Spectrum Twente is part of the Santeon group, a group of Dutch hospitals that collaborate and share information and experiences with each other. The other hospitals that were interviewed are also part of the Santeon group, enabling a free flow of information. This selection procedure can be seen as a form of purposive sampling where the researcher's judgement together with the judgement of the HRM Manager of MST was used to select the hospitals best suitable for providing qualitative information.

For the interviews a hospital in the northern region of the Netherlands was chosen, since this hospital has implemented SPP several years ago. In addition, a hospital located in the western part of the Netherlands was selected since this hospital is currently in the process of implementing SPP.

4.2.2.2 Data Collection Procedure – Interview with Santeon Hospitals

Similar to the interviews with stakeholders, the interviews with HR employees of the hospitals were administered face-to-face and were semi-structured, meaning that open-ended questions had been prepared before the interview but enough room was left to go further into detail regarding a certain topic. Questions discussed during the interviews with the HR employees included: *Which instruments are part of the SPP system used in the hospital?; How has SPP been implemented?; Who is responsible for using the instruments?; and What were the pitfalls you came across during the implementation of the SPP system?.* The complete interview protocol can be found in Appendix C.

4.2.3 Pilot Implementation & Focus Group Interview

The results of the above described interviews provided the basis upon which the preliminary SPP framework has been refined. The next step involved testing the refined framework by means of a small-scale pilot implementation. Implementing the refined SPP framework on a small-scale allows the usefulness and suitability of the framework and its instruments to be assessed, before an organization-wide implementation. After the pilot implementation, a group interview was held with the participants to assess their experiences regarding the appropriateness and usefulness of the instruments.

4.2.3.1 Selection Procedure

In general, participants in focus groups are not likely to represent the total population, since they have not been chosen by a probability sampling method (Babbie, 2010). Rather, the participants are often selected based on their willingness to participate and the researcher's judgement regarding the input the participants can provide. This sampling technique is a mixture of self-selection sampling and purposive or judgemental sampling and has been used in the current study. A pilot implementation has no use if the participants do not want to partake since it can negatively influence the results. Therefore, during the interviews with the business managers and the team leaders they were asked whether they would like to participate in the pilot implementation or not. Here, it was essential that a team leader could only participate in the pilot implementation when his or her business manager was also willing to participate. During the interviews, one business manager was particularly enthusiastic about partaking in the pilot implementation and selected two team leaders who were also willing to participate. The two departments managed by the team leaders are different from each other: one is a nursing department, the other a medical support unit. In addition to the team leaders and the business manager, the HR advisor and an HR support employee of the division participated in the pilot implementation and the group interview.

4.2.3.2 Data Collection Procedure

The pilot implementation consisted of three steps. First, the instruments of the SPP framework were put into action. A meeting with two team leaders and the HR advisor of the division was held. Prior to the meeting all participants received the instruments in Excel format together with the manuals to view before the meeting. These manuals can be found in Appendix D. During the meeting, the instruments and tools were explained and a start was made with the implementation of the instruments.

The next step involved the implementation of the instruments. The team leaders were asked to complete the HR3P-matrix and determine the demand for personnel in the future based on the PEST analysis, the EFE-matrix, strategic objectives, and scenario planning. The supply prognosis has been completed by the researcher herself. The HR support employee has provided the information regarding the current workforce; however, the Excel document used to perform the calculations is complicated to use. Should MST wish to use a similar approach, an expert should be invited to create a more sophisticated Excel document with which the HR advisor can perform the necessary calculations to make a prognosis of the future supply of personnel. For the same reason, the researcher created the fit table, based on the occupation table completed by the participants. The business manager assisted the team leaders in completing the demand forecast. After completing all

steps of the SPP framework, the researcher collected and combined the output of all instruments into the overall SPP outcome.

The final part of the pilot implementation consisted of the evaluation of the instruments and the implementation process. The focus of the pilot implementation lay not upon the actual outcomes of the SPP instruments. Rather, the pilot implementation was meant to test the usability and practicality of the instruments. To measure this, the focus group method was used: a group interview was conducted during which the opinions and experiences of the people involved in the pilot implementation were assessed. To guide the group interview, an interview protocol was created which can be found in Appendix E. Examples of questions asked during the group interview include: *Who completed/used the different instruments?; Were there any problems/difficulties in the completing/using the instruments?; and What is your opinion regarding the outcome of the SPP process as a whole?*

The people who participated in the group interview included the two team leaders, the business manager of the division, the HR advisor and a HR support employee. During the interview, special attention was paid to the usability, pitfalls, and shortcomings of the instruments, along with suggestions for improvement. In addition, participants were asked to name the positive aspects of the instruments and the perceived value of the instruments and the overall SPP system. Although the actual outcome of the SPP process was not the focus of the pilot implementation, the results have been discussed during the group interview to determine whether the instruments produce realistic and appropriate outcomes based on which actions can be taken. The overall findings of the group interview will be discussed in detail in Chapter 6.

4.3 Data Analysis

The interviews were recorded on a voice-recorder with the permission of the interviewee. The benefit of voice-recording the interviews is that it provides the opportunity to concentrate more fully on the answers given by the interviewee. In addition, the interview can be re-listened (Saunders et al., 2007). Besides recording the interviews, notes were taken during the interviews to serve as a back-up. In addition, it allowed the interviewer to take notes regarding the overall impression and observations to help interpret the responses. Afterwards, the interviews were transcribed based on the recording. The transcriptions of the interviews were sent to the interviewees for approval. Once the transcriptions were approved by the interviewees, the data was analyzed.

The above described data collection methods are qualitative in nature and yield qualitative data. Since the primary focus of a case study is to seek insights and collect in-depth, qualitative, information rather than statistical interpretations (Saunders et al., 2007), statistical analysis is neither feasible nor desirable to meet the research objectives.

Since the data collected was non-standardized, open coding was used to be able to analyze the data more efficiently. Babbie (2010) defines open coding as “the initial classification and labelling of concepts in qualitative data analysis” (p.401). Saunders et al. (2007) discuss two procedures for open coding qualitative data: categorisation and unitising data. First, categories, or codes, were determined based on the topics discussed during the interviews. Next, each individual transcript was

divided into units of data which, in turn, were attached to the categories. During these processes the data was reduced since unnecessary data has been removed, and rearranged to create a manageable dataset to analyze the data and draw conclusions. The categorized and unitized key findings of the interviews with end-users are summarized in Section 5.1. The results of the interviews with HR employees of other Santeon hospitals are described in Section 5.2.

Based on the key findings of these interviews, the preliminary SPP framework sketched in Chapter 3 is refined and tested by means of the pilot implementation. Here, qualitative data was collected by means of a focus group interview. Similar to the above described interviews, the group interview was recorded and transcribed. Since there was only one group interview, the data could not be cross-compared. To highlight the key findings of the group interview the data was summarized and categorized based on the different instruments tested. The results of the pilot implementation are discussed in Section 6.1. Based on the outcome of the pilot implementation, the refined SPP framework for MST is adjusted, resulting in the final SPP framework described in Section 6.2.

Although all interviews were recorded and the recordings were transcribed, the data is treated confidential and anonymity of the participants is ensured. Consequently the findings of the interviews, which are discussed in Chapter 5 and 6, are reported without the notion of names or other references that could reveal the respondent's identity, to preserve anonymity and confidentiality.

4.4 Reliability & Validity

Issues concerning reliability and validity of the research have been discussed throughout the previous sections. The following paragraphs summarize these issues and discuss the threats to both reliability and validity of the research.

4.4.1 Reliability

Reliability refers to the question whether repeating the data collection techniques would yield the same results each time (Babbie, 2010; Saunders, et al., 2007). Since non-standardized research methods were used, the findings reflect the reality at the time the data was collected and the situation is subject to change, thus attempting to replicate the study is neither realistic nor feasible. However, threats to reliability in the form of errors and biases are worth discussion. Robson (as cited in Saunders et al., 2007) distinguishes between four threats to reliability: (1) subject or participant error; (2) subject or participant bias; (3) observer error; and (4) observer bias.

1. The first error refers to “errors that may occur when research subjects are studied in situations that are inconsistent with their normal behaviour patterns, leading to atypical responses” (Saunders et al., 2007, p.612). To reduce this threat to reliability, the data collection techniques have been performed during working hours and took place in the office of the respondent. The group interview has been conducted in the office of the business manager included in the pilot implementation.
2. The second threat to reliability refers to participants providing biased answers by, for example, answering what they believe will influence the research results, or saying what they

believe that will make them look good in the eyes of their superiors. To reduce this bias, anonymity of the respondents has been ensured throughout the current study. In addition, open-ended questions and probing questions have been included in the interview which can help avoid bias (Saunders et al., 2007).

3. Observer error refers to errors made by the observer caused by, for example, tiredness. All interviews were voice recorded and have been transcribed after the interview based on these voice recordings. The transcriptions have been sent to the interviewees for approval. These steps have been taken to reduce the threat of observer error as much as possible.
4. The fourth threat to reliability described by Robson (as cited in Saunders et al., 2007) is the threat of observer bias which refers to the difference in interpretation between observers. Since there was only one researcher in the current study, the threat of observer bias was minimized.

4.4.2 Validity

Validity refers to the question whether the data collection techniques measure what they intend to measure and, ultimately, whether the findings are about what they appear to be about (Babbie, 2010; Saunders et al., 2007). Since qualitative data collection methods have been used, resulting in qualitative data, statistical analysis was neither feasible nor desirable in the current research setting.

Regarding external validity, the results of the current study are difficult to generalize to other hospitals or other organizations since only one case (i.e. MST) has been studied. However, since the aim of the current study is to develop a SPP framework for MST, generalizing the results is of less importance.

The selection procedure of self-selection can cause a threat to the internal validity of the findings. It is possible that people only participated because they liked the topic SPP; whereas people that did not support SPP or were not in favour of using SPP did not self-select in. In total, eight team leaders and four business managers of four different divisions were interviewed, thereby increasing the variation of the answers and ultimately the internal validity of the research. It can be argued whether eight team leaders out of a total of close to 100 team leaders form a representative sample. However, due to time constraints it was not possible to include more team leaders in the sample. The sample was aimed to be as representative as possible by including team leaders from different divisions.

Only two team leaders and one business manager participated in the pilot implementation. Although this number is low, it has been decided to only include these participants since they were enthusiastic about partaking in the study, which is likely to increase the reliability of the outcomes. Besides, the two team leaders who participated are responsible for managing two departments that are different from each other; this increased the representativeness of the sample, the variation of the answers and thereby the internal validity.

4.5 Conclusion

The data collection procedures described above aim at determining whether the selected SPP instruments work in practice in the current setting of MST. A case study strategy is used focussing on a single case: Medisch Spectrum Twente. An advantage of a case study strategy is that it increases acceptance from the people within the organization, thereby increasing the recognisability of the final framework as a solution to the problem, and increasing support from members of the organization. This is highly important to create a foundation for the actual implementation of the SPP framework and its instruments. Although the actual implementation of the framework is not part of the current study, the current research aims to create a positive environment in which, ultimately, the implementation can take place.

The process of collecting data consists of two parts. First, qualitative interviews with end-users and two HR employees of other Santeon hospitals were conducted. The purpose of these interviews was to explore the views and requirements of the end-users regarding the SPP instruments and the SPP system. The interviews with HR employees of other hospitals aimed at gaining knowledge and information about the SPP instruments used at the other hospitals, and their overall experiences with using the instruments. Based on the outcomes of these interviews the preliminary SPP framework sketched in Chapter 3 is refined. Next, the refined framework was tested by means of a small scale pilot implementation. During the pilot implementation all SPP instruments were put into action to determine whether the instruments work in practice. The experiences and opinions regarding the use of the instruments have been assessed via a group interview, based on the focus group method. Based on the findings of the pilot implementation and the group interview, the refined SPP framework is adjusted, resulting in the development of the final SPP framework for MST.

The following chapters describe the findings of the interviews and the pilot implementation. In addition, the changes to the preliminary selection of instruments that resulted from the data collection procedures are described. In order to avoid repetition, only the changes to the instruments are described in the next chapters. The final framework, including a detailed description of the working methods of all individual instruments, will be presented in Chapter 7.

5. TOWARDS A REFINED SPP FRAMEWORK

In Chapter 3, a preliminary SPP framework for MST has been developed. Interviews with end-users of the SPP framework and HR personnel of two other hospitals were conducted to determine whether the selected instruments included in the preliminary SPP framework are suitable to be used in practice. Section 5.1 provides an overview of the outcomes of the interviews with stakeholders. In Section 5.2, the findings of the interviews with HR employees of two Santeon hospitals are described. Based on the outcomes of the interviews, the preliminary SPP framework for MST is adjusted. Section 5.3 describes the changes to the framework and concludes with an overview of the instruments included in the refined SPP framework.

5.1 *Findings Interviews with Stakeholders*

In total, 13 interviews with stakeholders were held. The respondents included one RVE controller, four business managers, and eight team leaders. In the following paragraphs the overall findings are described. As mentioned in Chapter 4, the findings are reported without the notion of names or other references to preserve anonymity and confidentiality.

5.1.1 Awareness

Six of the eight team leaders interviewed were not familiar with SPP. Although workforce planning on an operational level is something that occupies all team leaders, only two mentioned that they think about long term personnel planning. However, during the course of the interview all team leaders admitted that they do, on some level, think about the future personnel availability, the impact of strategic issues, and the workforce necessary in the long term. Only two team leaders said to be aware of the impact of changes in the external environment on their workforce. Three business managers said they are familiar with SPP although it is not something they use at the moment. In general, all business managers argued that it is complicated enough to determine the requirements for the current workforce, let alone planning a future workforce.

It is remarkable to note that five team leaders mentioned that SPP is necessary and they would like to see it implemented. One team leader mentioned the fact that, on average, a new employee is coached and trained on the job during a year before he/she is able to perform all tasks independently and has a sufficient amount of experience within the department. Another team leader pointed out that for a specific function a new employee is trained via MST for two years. This creates the need for SPP: team leaders want to be able to determine beforehand how many employees need to be trained so they can anticipate on this and start training in advance.

5.1.2 Current Workforce & Future Supply of Personnel

First of all, the RVE controller was interviewed to determine what information is available regarding the current workforce. From this interview it became clear that the personnel information system used by MST is *Beaufort*, which contains all personnel information regarding the general characteristics of individual employees such as name, function, date of birth, FTE, and type of contract. This data can easily be transferred to an Excel document and can be sorted in different ways, for example based on functions or the department where the employee works. Team leaders,

business managers, and HR advisors also have access to this information. Concerning flow, the RVE controller argued that little information is available regarding internal flow. Besides, the data that is available mainly concerns internal flow within a department; data regarding flow between departments is more difficult to obtain. Details about outflow and inflow are easier to collect, both on individual level as well as on a more abstract level, for example per department.

After interviewing the RVE controller, team leaders and managers were interviewed. All team leaders confirmed that they have access to all necessary information contained in Beaufort. The team leaders noted that internal flow rates are low. Although internal flow within a department can occur by, for example, promotion; flows between different departments is less common. Three team leaders mentioned that employees need specific skills to work in their department, meaning that it is not always possible for each employee to transfer to their departments. Also, the team leaders believe that people specifically choose to work in a certain department, making it less likely for these employees to voluntarily flow to another department.

In addition to the low internal flow rates of employees flowing between departments, team leaders mention that there is hardly any outflow; most employees enter the workforce and remain there until they retire, which can be seen by the great number of jubilees. According to the business managers, the only personnel that flow out of the organization consist of physician assistants and employees with temporary contracts. A frequently heard argument for the low outflow rates is that employees do not want to leave the region. There are not many other hospitals in the region, thus competition is low. Also, the team leaders feel that people specifically choose for a certain function within a specific department and once they are occupying the position they want, they remain there. A direct result of the low outflow rates is the high average age of the employees: one team leader mentioned that the average age within his/her department is between 40 and 50 years of age; another believes that 50% of the department's workforce is between 45 and 60; a third calculated the average age of the team to be 42 years with an average employment period of 16 years.

Besides the relatively high average age of the workforce, many employees work part-time rather than full-time. In general, team leaders believe that personnel enter the workforce when they are approximately 25-30 years old. They work a few years full-time, then start a family and work part-time. The work-social life balance is becoming increasingly important. Overall, the interviewed business managers concurred with the information provided by the team leaders.

Regarding the quality of the current workforce, both team leaders as well as business managers referred to the annual appraisal interviews. During these annual interviews, a set list of topics is discussed. The downside, according to most interviewees, is that they are not supposed to formally judge or criticize the employees. They can only assess the functioning of the employees based on the set requirements of the function they occupy. Seven team leaders argued that they would like to assess employees on other aspects as well, such as their attitude, pro-activity, and behaviour.

Five interviewed team leaders admitted that they do not have a sufficient overview of the current performance and potential of their employees. Three team leaders, on the other hand, mentioned that they have a clear picture of the performance and potential. This appears to depend on the team leader in question.

5.1.3 External Environment, Corporate Strategy, & Demand for Personnel

All business managers and team leaders said to have a clear view of the external factors influencing their department. External factors such as the increasing complexity of health care; changes in working methods; technological advancements; and changes in laws and legislation are considered at the departmental level. However, the team leaders do not always translate these changes into changing demands in terms of personnel. Business managers have said to be able to determine what quantity and quality of personnel is needed based on the changing external environment.

Most participants argued that it is difficult to develop strategic plans when the overall strategy of MST is uncertain. Currently, the corporate strategy of MST is outdated and not clear which leads to the fact that team leaders and business managers feel they lack guidance. Although there is no clear corporate strategy, there are corporate annual plans based on which most team leaders make year plans for their department. These annual plans include points of action and strategic direction of the department with regard to, for example, increasing efficiency and reducing the duration of hospitalization of patients. In these plans, only two team leaders take into account the external factors that influence their department. The other six interviewed team leaders create the annual plans based merely on the strategic objectives of the organization. Four interviewed team leaders mentioned that all employees are involved in the development of the department's objectives. All employees within a department are asked to name or select a few focus points regarding what he/she thinks is important for the department in the upcoming year(s). From these focus points a selection is made which is incorporated in the year plans of the department. The team leaders note that the main benefit of this is that the employees are more concerned with the plans of the department and feel responsible for meeting the objectives.

It is believed that, if corporate strategic plans were available, the team leaders and business managers together would be able to determine the strategic objectives of their department for a longer period of time. Although there is currently no corporate strategy, the organization is in the process of developing this. Once the organization has developed its corporate strategy it can be used as a basis for the strategic objectives of the departments. This, in turn, can be translated into the number and type of personnel necessary to reach these objectives.

One team leader mentioned that it would be possible to plan five years in advance and that estimations and predictions regarding the (uncertain) future would help focus the department and the organization as a whole. Although this respondent did mention that the estimations would be highly uncertain and would most likely have to be altered frequently. The rest of the participants believe that it is not feasible to plan five years in advance; two to three years in advance would be possible.

5.1.4 Responsibility

One business manager mentioned that the SPP process should be centrally coordinated. Although the implementation of the individual instruments and the collection of necessary input can be decentralized; in order to get a clear overview of all departments combined central coordination is necessary. In addition, this business manager mentioned that when there is no central coordination, departments start to develop their own tools and instruments, resulting in a lack of support for the overall SPP system.

Another business manager noted that certain instruments cannot solely be seen as the responsibility of the team leader or business manager. This business manager suggested that all responsible persons work together as a team. Certain team leaders have a good feeling for strategic issues and are capable of estimating future problems. Others, however, lack this ability. Therefore, it would be most beneficial when a team leader and a business manager work together on SPP, perhaps assisted by the HR advisor of the division.

5.1.5 Summary

From the interviews with the end-users of the interview it became apparent that most team leaders are not familiar with long-term personnel planning; business managers on the other hand are familiar with SPP but do not currently use it. Although most team leaders are not familiar with SPP, they do see a need for it and would like to see it implemented within MST.

The personnel information system used by MST is Beaufort. This system contains all information available regarding the current workforce. Team leaders, business managers, and HR advisors all have access to the information in Beaufort. Although information regarding inflow and outflow is available, little data exists regarding internal flow. According to the team leaders and business managers this is mainly because there is hardly any internal flow between departments. The data that is available concerning internal flow is not specific enough to be able to draw concise conclusions. Regarding quantitative information, business managers and team leaders referred to the annual appraisal interview during which an employee is assessed. However, the general belief among the interviewees is that these appraisal interviews do not provide much flexibility to appraise and criticise on other aspects besides the criteria specified in the employee's job description.

Both team leaders as well as business managers said they have a clear view of the external factors influencing their department, although the effect on the workforce of the department is often not considered. With the rapidly changing external factors in mind, the respondents believe that it is neither feasible nor desirable to plan five years in advance; a planning horizon of three years is more appropriate in the current setting.

Currently, the corporate strategy of MST is outdated, although there are corporate annual plans available. MST is currently in the process of developing a corporate strategy. Once the corporate strategy is developed and communicated, the strategic objectives of the departments can be created, thereby providing input for the SPP system.

Concerning the responsibility for the implementation of the SPP process and the instruments, it can be suggested that the SPP process should be centrally coordinated; the actual planning should be decentralized.

Based on these findings, combined with the findings of the interviews with HR employees of two other hospitals, the preliminary SPP framework developed based on the theoretical background can be refined. The effects these findings have on the framework and the individual instruments are described in Section 5.3.

5.2 Findings Interviews with Santeon Hospitals

Two interviews were conducted with HR personnel of two Santeon hospitals: one HR employee of a hospital located in the northern part of the Netherlands, and one HR employee hospital located in the western region of the Netherlands. In order to ensure anonymity the names of the hospitals will not be mentioned. Rather, the hospitals will be referred to as the northern hospital and the western hospital.

Both HR employees have been involved in the development and implementation of SPP within their hospital. SPP has been implemented within the northern hospital a few years ago. The western hospital is currently in the process of implementing the SPP system they developed. The goal of the interviews was to gain an impression of the instruments used for SPP, how it has been implemented, and how it is currently organized within another hospital.

5.2.1 Strategic Personnel Planning

The northern hospital has developed its own system for SPP. Currently, this systems has the format of an Excel document where all necessary calculations are made. They are in the process of creating a software application that can be linked to the personnel information system they use (*Profit*) to easily compile the data. The western hospital has not yet developed a complete system; instead, they use different instruments that are used independent from each other, although some tools produce the input for other instruments.

Both the northern and the western hospital centrally coordinate the SPP process. At the northern hospital there is one person in charge of combining all data from the different departments; at the western hospital a project group has been formed to manage the process. HR advisors, managers, and team leaders are also part of the process. At both hospitals the HR advisors discuss with the business managers and team leaders the demand for personnel in the future.

The HR employee of the northern hospital suggested that SPP is not only useful in times when the labour market is scarce: it can be beneficial during all sorts of reorganizations, downsizing, and other organizational changes that impact the workforce of the organization. The SPP system can help determine whether people need to be laid off or whether the natural-outflow alone is sufficient. In addition, SPP can help with relocating employees and suggest paths for internal mobility.

The SPP system of the northern hospital has been implemented there for three years and was first implemented in a select group of departments. The western hospital is currently in the process of implementing the instruments and starts per function category rather than per department or RVE. The respondent of the northern hospital mentioned that the entire SPP process is completed once a year. Since their system will be linked to the personnel information system, the supply of personnel can be determined at any moment in time and is not time consuming. The interviewee of the northern hospital noted that the first time SPP is implemented it consumes much time, particularly determining the demand for personnel. However, once the first round is complete, the next time it will be less time consuming since all people know what to expect and what is expected of them.

5.2.2 Current Workforce & Future Supply of Personnel

Qualitative information regarding the potential and performance of the current workforce is not included in the SPP system of the northern hospital. According to the HR employee of northern hospital this is because it is difficult to predict the future quality of the workforce based on current data, omitting the need for data regarding performance and growth potential. However, qualitative aspects are to some extent included: at the northern hospital as well as the western hospital a distinction between different function categories is made based on the job rating system, also known as the FWG (functiewaardering gezondheidszorg), where jobs are rated based on, for example, the qualifications, knowledge, and competencies needed to occupy a function. Thus, quality is specified by means of the FWG scale.

Both the SPP system of the northern hospital as well as the process used by the western hospital start by portraying the internal supply of personnel specified per function. Based on the data available in their personnel information system they estimate the future supply of personnel by determining the outflow over the years. Both organizations make a distinction between the natural-outflow (i.e. outflow due to retirement and temporary contracts) and regular- or other-outflow. The other-outflow is determined as a percentage representing the organization's average outflow rate. The current workforce in numbers of FTE per function, minus the total outflow results in an estimation of the personnel available in the future. The northern hospital calculates the outflow per RVE and per function category in order to compare similar functions of different RVE with each other.

In analyzing the current workforce to estimate the future supply of personnel, the northern hospital only determines outflow. The western hospital also considers the average time a vacancy remains unfilled, and not only determines what they have now – in terms of employees – but also the workforce that is currently required.

Creating an overview of the current workforce and the thereon based future supply of personnel is an important step of the SPP process. Both the northern hospital and the western hospital mention that determining the future availability of personnel alone provides many insights and displays certain problem areas and bottlenecks. Thereby, it creates awareness and support for the overall SPP system among managers and team leaders. The respondent from the northern hospital mentioned that not all managers and team leaders are eager to cooperate with the SPP process because they do not see the need for it. By predicting the future supply of personnel the need becomes visible.

In addition to the internal supply of personnel, the western hospital also analyzes the external supply of personnel by monitoring the external labour market and the trends therein. The northern hospital does not include this analysis in the SPP process; rather they turn to the external labour market when an outcome of the SPP process is that a certain function is likely to be understaffed in the future.

5.2.3 Demand for Personnel

Regarding the future demand for personnel, the northern hospital includes three factors into their analysis: production rates, innovation of work processes, and technological developments. For each external factor the managers determine what the influence is on the number of FTE required in the future. The western hospital includes similar external factors in determining the demand for

personnel, but adds other factors such as changes in laws and regulations, and the strategic direction of the organization.

The HR employee of the northern hospital believes that managers are capable of making more or less accurate predictions regarding the demand for personnel in the future. The managers need to be supported in the process by an HR advisor, who, in turn, must be trained on how to stimulate the manager to make an accurate and realistic forecast.

5.2.4 Outcome of the SPP Process

After determining the supply of and demand for personnel, the outcome is evaluated and possible solutions are sought. The results of the individual RVEs are discussed with the managers and team leaders. According to the HR employee of the northern hospital, many managers are surprised by the outcome regarding the future supply of personnel since it usually portrays a great shortage of personnel. However, it must be kept in mind that inflow is not included in the analysis, the outcome mainly displays how the current workforce transforms if nothing would change (i.e. no inflow; no change in policies). In addition, a large part of the outflow is caused by temporary contracts. Therefore, a shortage can partly be overcome by simply extending some of the temporary contracts. These issues must be kept in mind when the outcome is communicated to the managers and team leaders. During a discussion with the managers and team leaders the problem areas of the individual RVEs are identified. The overall results are communicated to the HRM department who can take further actions if necessary.

Both respondents stress the fact that it must be kept in mind that SPP is not book-keeping or straightforward mathematics, and the outcome of the SPP process is not necessarily correct. SPP concerns predicting the future which cannot be done with complete accuracy. However, SPP aims to offer tools to predict the future as accurately as possible to enable an organization to anticipate and plan for the future.

5.2.5 Summary

Two interviews were conducted with HR employees of two Santeon hospitals to gain knowledge regarding the approaches taken by these hospitals regarding strategic personnel planning, the instruments used, and the implementation of the framework. In one of the hospitals SPP has been implemented for a few years, the other hospital is currently in the process of implementing SPP. Both hospitals have developed their own SPP systems which are very different from each other. The system used by one of the hospitals is mainly based on an Excel document in which the necessary (numerical) calculations are made. Here, they focus mainly on quantitative data, rather than qualitative details. The other hospital uses different types of formats for the different instruments. Both hospitals include qualitative aspects by distinguishing between different function categories based on the job rating system.

Both hospitals start by analyzing the current workforce and the estimated outflow that is likely to occur in the future. A distinction is made between natural-outflow and other-outflow, which is calculated per function category per RVE. Both hospitals agree that portraying the current workforce

and predicting the future supply of personnel can serve as an eye-opener and highlights problem areas.

The demand for personnel is determined based on several factors. One hospital only includes production rates, innovation of work processes, and technological developments based on which a prognosis for the future demand is made. The other hospital includes similar factors but adds changes in laws and regulations and the strategic direction of the organization.

The outcome of the SPP process is evaluated and discussed with the team leaders and managers. Most managers are surprised by the outcome of SPP, specifically regarding the future supply of personnel. This is due to the fact that it inflow is not included in the analysis and a large part of the outflow is caused by temporary contracts that end.

Finally, SPP cannot be seen as straightforward book-keeping: the outcomes are not necessarily correct but aim to predict the future as accurately as possible to enable an organization to anticipate and offer tools to plan for the future.

The effects these findings have on the preliminary SPP framework will be discussed in the following section, where the preliminary SPP framework will be adjusted based on the findings of the interviews with HR employees of the Santeon hospitals combined with the findings of the interviews with the end-users of the instruments.

5.3 Refined SPP Framework for MST

Based on the outcomes of the interviews described in the previous sections, the preliminary SPP framework for MST sketched in Chapter 3 can be adjusted. Some of the instruments selected previously to be part of the SPP framework need minor adjustments, other instruments can be omitted or new instruments have to be added. The following paragraphs describe these changes and conclude with the refined SPP framework and its instruments.

5.3.1 SPP Coordination

Based on the outcome of the interviews, some small changes can be made regarding the overall SPP coordination. Initially it was determined that the team leader had the main responsibility regarding the SPP process, albeit with assistance from the HR advisor and the business manager. However, information gained during the interviews suggests that the HR advisor should be the main person coordinating the SPP process within the departments he/she is responsible for. The HR policy department will provide the necessary tools and information on how to work with the tools, after which the HR advisor implements the instruments within the different teams and coordinates the process. Although the team leaders and business managers are still responsible for providing the necessary information, the HR advisors should guide the entire process. In order to do this, the HR advisors will need to be trained on the subject. This will be elaborated on in Chapter 7.

In Chapter 3 it was described that the departments can be divided into categories. It was mentioned that, prior to starting the SPP process, a consensus must be reached regarding which categories to use. The interviews with the HR employees of the western hospital and the northern hospital

revealed that it is important that these categories are chosen with care. As will be described in Paragraph 5.3.3.2, the categories can best be selected based on the functions of the employees as specified in the job rating system, the FWG. By dividing the employees in these categories it becomes possible to compare different departments within the organization. This provides opportunities regarding internal mobility and relocating employees.

5.3.2 Current Workforce

As described in Chapter 3, the preliminary SPP framework used the personnel information system, the IDU-matrix, and the HR3P-matrix to portray the current workforce of the organization. Based on the interviews some alterations can be made which will be described in detail in the following.

5.3.2.1 Personnel Information System

The personnel information system can be used to portray the general information of the current workforce. During the interviews, it was found that the personnel information system used by MST is Beaufort. This system contains all (quantitative) information regarding the personnel and is suitable to be included in the refined SPP framework. The main information necessary to portray the current workforce consists of the age of the employees, the type of contract each employee has, the number of FTE per employee, and their function. This information is necessary per department. Flex-workers and employees temporarily hired via an employment agency are not to be included in the analyses. These employees form the flexible layer that can be used to overcome short-term and unforeseen shortages of personnel and are not part of the regular workforce.

Previously, it was determined that the RVE controller should be responsible for providing this information. However, during the interviews it became apparent that the business managers, the team leaders, and the HR advisors have access to this information. Therefore, it is more straightforward to exclude the RVE controller from this process.

5.3.2.2 Flow

In Chapter 3, the IDU-matrix has been described as a means to portray all inflow, internal flow, and outflow within a department during a certain period of time. However, the data reveals that there is hardly any internal flow within and between the departments. In addition, outflow is fairly low: an overall finding of all interviews is that employees generally work within one department for a long time. Besides, the necessary data regarding flow is difficult to obtain. Therefore, the IDU-matrix will not be included in the refined SPP framework for MST.

However, outflow needs to be measured since it is a vital part of forecasting the future supply of personnel. At the western hospital and the northern hospital, a distinction is made between *natural-outflow* and *other-outflow*. Natural-outflow refers to outflow caused by retirement and temporary contracts. Other-outflow refers to a percentage of employees that flows out of a department (or out of the organisation) for other reasons. To determine the natural-outflow, data regarding the date of birth of the employees is necessary to determine the outflow due to retirement. In addition, the type of contract per employee needs to be known to establish how many employees have a temporary contract and when this contract ends. Finally, information regarding the current function category together with the FTE is necessary. This information can be derived from Beaufort.

To determine the other-outflow-percentage, which is similar to the transition probability as described in Chapter 3, a few calculations can be made. The information necessary for these calculations consist of historical data (i.e. data of the previous year) regarding the outflow per function category, per department, per year. This can be filled out in a simple table which will be described in detail in Paragraph 5.3.3 where the methods to forecast the supply of personnel are discussed.

5.3.2.3 Quality

The HR3P-matrix has been described in Chapter 3 as a method to portray the quality of the current workforce and estimate the future quality of the personnel. However, since it is difficult to accurately predict the performance and potential of employees in the future, the HR3P-matrix will not be used to estimate the future quality of the personnel. Nevertheless, the HR3P-matrix does provide insights into the employees' current performance and growth potential, thereby illustrating bottlenecks and highlighting focus areas. Especially when looking at how to overcome a gap (after determining the fit between the supply of and demand for personnel in the future) the HR3P matrix can be a useful tool to determine whether there are possibilities regarding flow. Therefore, the HR3P-matrix will be included in the SPP framework for MST to portray the current workforce but it will not be used to determine the future supply of personnel.

5.3.2.4 Current Required Workforce

From the interview with the HR employee of the western hospital it became apparent that the western hospital also considers the workforce currently required. Here, they determine what their current workforce is and what their current workforce should be. This will not be included in the SPP framework for MST since it is likely that this would complicate the SPP process largely without adding much extra value. It is unrealistic to believe that the organization can change many things regarding their current workforce to create the workforce required now. Changing a workforce takes much time, specifically for a large organization. Therefore, it is not necessary to determine the workforce that is desired now; it is too short-term to change it. Rather, when determining the workforce required in the future, it is compared with the current workforce. This gives the organization time to change and alter the current workforce into the workforce desired in the future.

5.3.3 Supply of Personnel

After portraying the current workforce, estimations can be made regarding the future supply of personnel. In Chapter 3, the use of the Markov model and the P&P matrix has been suggested. Based on the findings of the interviews some changes are made to the preliminary selection.

5.3.3.1 Quantity

The Markov model was selected to predict the future flow of personnel based on the output of the IDU-matrix. However, as described in Section 5.3.2.2 the IDU-matrix will no longer be part of the SPP framework for MST since information regarding inflow and internal flow are less relevant in the current setting and the information is difficult to obtain. Therefore, the calculations that would be made by a Markov model can no longer be performed, eliminating the need for the Markov model.

Since outflow is an important determinant of the quantity of the workforce available in the future, it does need to be incorporated in the SPP framework. As previously described, the natural-outflow

and other-outflow will be portrayed in the analysis of the current workforce, based on which the quantity of the personnel available in the future can be determined. Part of the Markov model, the transition probability, will be included in the SPP framework to determine the other-outflow, albeit with some alterations. In addition, an extra tool will be added to replace the Markov model in calculating the natural-outflow.

➤ **Other-outflow-percentage**

The other-outflow can be determined in the form of a percentage representing the probability of employees flowing out of the department. This has previously been described as the transition probability. The transition probability described in Chapter 3 considered internal flow as well as outflow, thus it needs to be altered to include only outflow. Internal flow (i.e. flow within a department) is excluded for two reasons: (1) the information is not always available per department; and (2) employees flowing internally within a department is not something that frequently happens.

Since the goal is to determine the outflow per function category, the transition probability, from this point on referred to as the other-outflow-percentage, should be determined per function category per department. Here, it does not make any difference whether the employee moves to another department, or whether the employee leaves the organization, it is both regarded as outflow. Since the supply of personnel is determined per function category per department, the functions within a department are treated separately, thus a distinction between different outflow destinations is not made.

➤ **Natural-outflow**

The natural-outflow can be calculated by filling in the details of the employees per department in an Excel sheet. The necessary information can, as described previously, be extracted from the personnel information system Beaufort. By inserting simple formulas the Excel sheet can calculate how many FTE will flow out of the department based on the year of birth of the employees and the type of contract they have.

➤ **Total outflow**

Once both the natural-outflow and the other-outflow-percentage have been calculated, simple calculations can be performed to transform the data into a forecast for the next three to five years. These calculations can be performed in an Excel sheet and require the outcome of both the outflow overviews to be combined.

5.3.3.2 Quality

The P&P matrix, which is based on the HR3P-matrix, has been included to portray the quality of the future workforce. However, it is nearly impossible to translate the HR3P-matrix into a reliable overview of the personnel available in the future. This is due to the fact that the HR3P-matrix and the similar P&P matrix assess the current performance of the employees and the potential they currently have. Therefore, the P&P matrix will not be included in the refined SPP framework as a means to determine the future quality of the workforce.

Since the HR3P-matrix was the only tool selected to portray the quality of the future workforce, it is worth determining whether another instrument has to be included. When looking at the results of

the interviews with HR employees of the other hospitals, it becomes apparent that both hospitals incorporate qualitative aspects by making a distinction between different functions by, for example, distinguishing between a general nurse and a specialized nurse. This distinction is also made in the job rating system of MST, known as the FWG, where jobs and functions are rated based on, for example, the qualifications, knowledge, skills, and competencies necessary to occupy the function. The same principle has already been incorporated to some extent in the preliminary framework when the workforce was divided into categories. By selecting categories based on the functions described in the FWG system, quality of the employees can be incorporated in the SPP framework.

5.3.4 External Environment & Corporate Strategy

The PEST analysis has been described in Chapter 3 as a means to portray the influential external factors, which can be assessed by means of the EFE matrix combined with the EFTE-method. The PEST analysis as well as the EFE matrix will be included in the refined SPP framework for MST. However, a small change will be made regarding the EFE matrix. In the EFE matrix described in Chapter 3 a distinction is made between external factors that pose opportunities and those that can be considered as threats. Since this distinction does not add value to the process of determining the demand for personnel in the future, this distinction will not be made in the EFE matrix included in the refined SPP framework.

Regarding the strategic objectives of the department, most teams have some sort of strategic plan. However, these mainly cover the plans for the upcoming year instead of the upcoming three years. In addition, many team leaders and business managers feel that they need a clearer corporate strategy in order to determine the strategic plans of their department. Although this could be a problem area, the pilot implement should reveal whether the team leaders and business managers can determine the personnel needed based on the strategic plans and objectives of their department.

Whether the EFTE-method is incorporated will be left for the business managers to decide. The tool can be offered as an option; however during the interviews it became clear that many managers have their own qualitative approach. If a manager is more experienced with another approach, for example brain storming, he or she should be able to use that technique. The interviews showed that most business managers have regular management team meetings with team leaders, the HR advisor, and other employees. Therefore, it is suggested to discuss the issues of the external environment in the strategic plans during these management team meetings or a similar meeting.

5.3.5 Demand for Personnel

In Chapter 3, scenario planning and the occupation table have been suggested as instruments to forecast the demand for personnel in the future. Based on the outcome of the interviews, no changes can be suggested. Thus, these instruments will be incorporated in the SPP framework as tools to determine the demand for personnel.

Since these steps are closely related to the processes described above regarding the external factors and the strategic objectives, these can be performed during the same meeting where the external factors and objectives are analyzed. Thus, directly after highlighting the external factors and evaluating these factors by means of the EFE matrix, scenario planning can be used to determine the

effects of the external factors on the personnel necessary in the future, which can be listed in the occupation table.

5.3.6 Fit between Supply and Demand

Although some change have been made to the preliminary SPP framework based on the outcome of the interviews, the final step of the SPP process remains the similar: a simple fit table will be used to determine the fit between the future supply of personnel and the future demand for personnel. However, the fit table described in Chapter 3 will be altered slightly.

Although the function of the table remains similar, the layout will be adjusted to provide a clearer overview of the entire SPP process and the outcomes. The fit table that will be in the preliminary SPP framework consists of five columns containing quantitative data regarding: the current workforce; the total outflow in the next three years; the personnel available in the next three years (the current workforce minus the total outflow); the demand for personnel in three years; and the fit (the difference between the demand for personnel in three years and the personnel available in three years). These data will be displayed in number of FTE per function category.

5.3.7 Actions

The actions necessary to overcome the gap or surplus between the supply of and demand for personnel in the future fall outside the scope of this research and thus have not been described previously. However, the outcome of the interviews showed some interesting results that can be included in the framework.

As previously described, it can be suggested to first look at all departments together. If, for example, the outcome of the SPP process is that there will be a shortage of nurses in one department, other departments can be searched where they have an overcapacity of nurses. This provides opportunities for internal mobility and relocating employees.

In addition, the HR3P-matrix completed at the beginning of the SPP process can be used to determine which employees might be suitable to be transferred to another function should there be an overcapacity in one function category and an under capacity in another position. The HR3P-matrix can be viewed to determine if there are employees who have the potential to grow and can be promoted, or employees who are under performing and might perform better in a different position.

5.3.8 Summary

Based on the outcomes of the interviews with stakeholders and the interviews with two HR employees of other hospitals, some adjustments are made to the preliminary SPP framework. Some instruments have been excluded from the framework, two additional instruments have been added, and several instruments have been altered slightly by, for example, changes in the layout of the representation. For instance, the IDU-matrix has been excluded from the SPP framework since it is unlikely that the IDU-matrix will provide realistic information due to the fact that the necessary data is difficult to obtain. Besides, the Markov model that was selected in the preliminary framework will no longer be included in the refined framework; a total outflow calculation will be inserted to replace the Markov model. In addition, two instruments have been added to the framework to suggest

possible actions that can be taken to overcome any discrepancies between the supply of and demand for personnel in the future. These are some of the examples of the changes that have been made to the preliminary framework based on the outcomes of the interviews. Table 15 summarizes all changes and portrays the instruments included in the refined framework.

	Preliminary Framework	Changes	Refined Framework
Current Workforce	Personnel information system	The personnel information system used by MST is referred to as Beaufort.	Beaufort
	IDU-matrix	Instrument excluded from SPP framework	-
	HR3P-matrix	No changes	HR3P-matrix
Supply Prognosis	Markov model	Markov model is replaced with a total outflow calculation	Total outflow
	P&P matrix	Instrument excluded from SPP framework	-
External Environment	PEST analysis	No changes	PEST analysis
	EFE matrix	No distinction between opportunities and threats	EFE matrix
	EFTE method	Included as an option, not required.	(EFTE method)
Corporate Strategy	EFTE method	Included as an option, not required.	(EFTE method)
	Strategic objectives	No changes	Strategic objectives
Demand Prognosis	Scenario planning	No changes	Scenario planning
	Occupation table	No changes	Occupation table
Fit	Fit table	Different layout – 5 columns instead of two.	Fit table
Actions	-	Included in refined framework	Organization wide overview
	-	Included in refined framework	HR3P-matrix

Table 15 - Summary Changes to Preliminary SPP Framework

5.4 Conclusion

Throughout the previous paragraphs, the results of the interviews with stakeholders and the interviews with two HR employees of two Santeon hospitals have been discussed. The findings of the interviews have led to a couple of changes to the initially selected instruments: some of the instruments have been excluded from the SPP framework; some new instruments have been added; and some instruments have been altered slightly. The preliminary SPP framework was developed solely based on the theoretical background; by means of the interviews, the preliminary SPP

framework has been altered and tailored towards the needs and requirements of MST. Figure 6 illustrates the refined SPP framework for MST based on the outcome of the interviews.

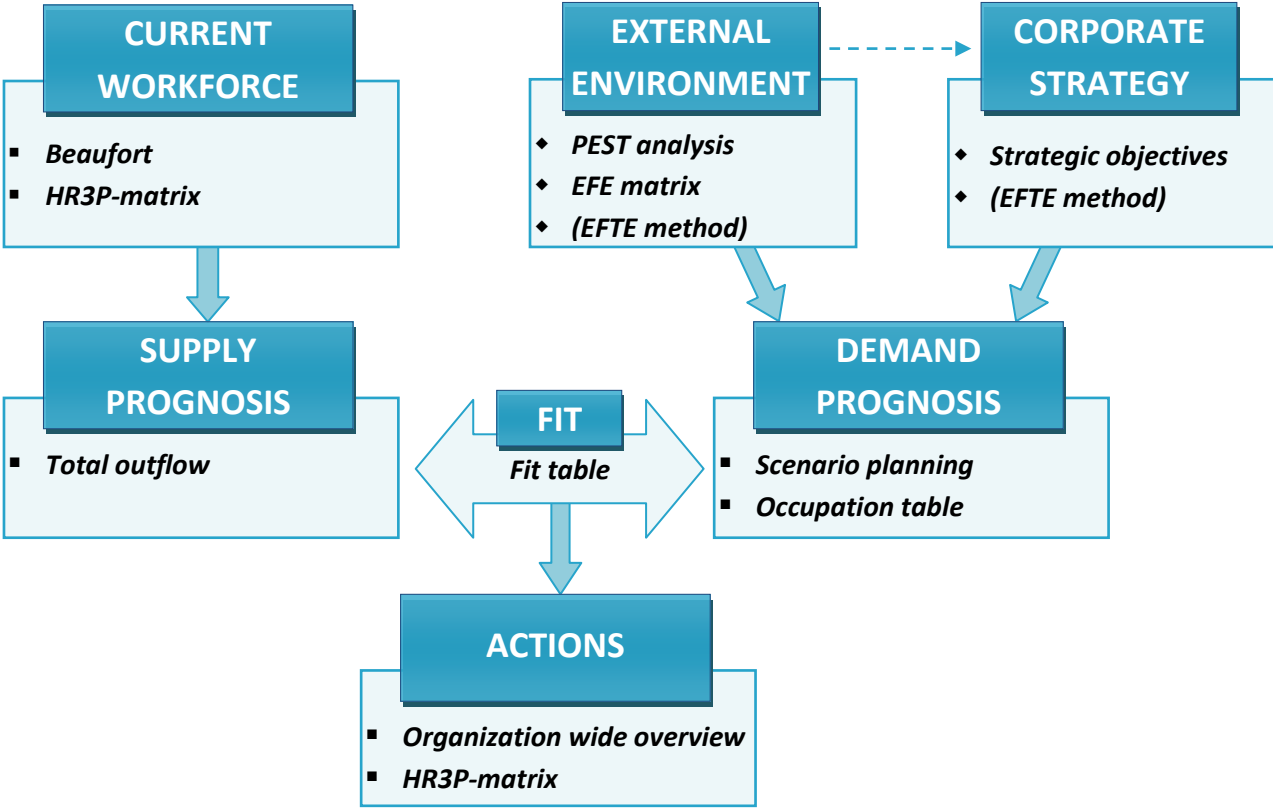


Figure 6 - Refined SPP Framework

Although the refined SPP framework has been developed taking into account the needs and requirements of the end-users of the instruments, it is possible that one or more of the instruments are not fully suitable to be used in practice within the current setting of MST. For example, the interviews showed that the end-users of the instruments feel that they are capable of using the instruments and gathering the necessary input. However, since the end-users have not actually used the instruments it is difficult to predict whether they are truly capable of gathering the necessary input and using the instruments. Therefore, a pilot implementation is performed and assessed in order to test the practicality, usefulness, and suitability of the refined framework in the current setting of MST. During the pilot implementation the instruments are put into action making it possible to determine whether end-users can work with the instruments and whether the instruments yield realistic results. The findings of the pilot implementation are discussed in the following chapter.

During the pilot implementation it will be assessed whether the necessary input can be obtained and transformed into the desired output. Since these are the main points to focus on during the assessment of the pilot implementation, Table 16 provides an overview of the different instruments that form the refined SPP framework for MST, the input required for each instrument, the output generated, and the persons responsible for working with the instruments.

Section	Instrument	Input	Output	Responsible Persons		
				Team leader	Business manager	HR advisor
Current Workforce	Beaufort	Information per employee: year of birth; type of contract; FTE; function (FWG).	Overview general information of all employees in a department	X		X
	HR3P-matrix	Current performance & growth potential per employee per category	Overview of performance and potential of the workforce per category per department	X		
Supply Prognosis	Natural-outflow	Output of Personnel Information System	Overview of natural-outflow expected in upcoming years			X
	Other-outflow-percentage	Outflow rates of pervious year(s)	Overview of other-outflow percentage expected in upcoming years			X
	Total outflow	Natural-outflow & other-outflow-percentage	Overview of all expected outflow in upcoming years			X
External Environment & Corporate Strategy	PEST analysis	Data concerning external factors (political, economic, socio-cultural, technological factors)	Overview of external factors	X	X	
	EFTE-method	Interview/questionnaire; knowledge on topic	Opinion of professionals; impression of the subject in question	X	X	X
	EFE matrix	PEST analysis & EFTE-method	Overview of external factors and their importance to the human resource of a department	X	X	X
	Strategic plans	corporate strategy & department's strategic objectives; EFTE	Summary of department's strategic objectives relevant for personnel planning	X	X	X
Demand Prognosis	Scenario planning	EFE matrix & department's strategic objectives	Scenarios	X	X	X
	Occupation table	Strategic objectives of the department & scenarios	Overview of personnel required in the future	X	X	X
Fit	Fit table	Markov model & occupation table	Fit between supply and demand in the future	X		X
Actions	HR3P-matrix	HR3P-matrix concerning the current workforce	Suggestions who can be promoted/transferred	X	X	X
	Org.-wide overview	Completed SPP framework of all departments	Overview of shortages/surpluses per function category			X

Table 16 - Overview Instruments Refined SPP Framework

6. TOWARDS THE FINAL SPP FRAMEWORK

In Chapter 3, a preliminary SPP framework for MST has been developed based on instruments and methods described in the theoretical background. By means of interviews with end-users of the instruments and HR employees of two Santeon hospitals, the initial selection of instruments has been refined, as described in Chapter 5. Next, the refined framework has been tested through a pilot implementation. The pilot implementation has been assessed via a group interview to determine the usability and practicality of the instruments. During the group interview, each instrument was discussed and evaluated. Based on the findings of the pilot implementation, the SPP framework for MST can be finalized.

The current chapter starts by describing the findings of the pilot implementation and the group interview. Based on these findings, the final changes to the framework are described resulting in the development of the final SPP framework for MST, which is illustrated in Section 6.2. To avoid repetition, the current chapter describes only the changes to the framework with respect to the preliminary and refined SPP framework developed in the previous chapters. The final SPP framework for MST, along with the individual instruments, the working methods, and procedures are described in detail in Chapter 7.

6.1 *Findings Group Interview*

To recall, during the pilot implementation the two team leaders were responsible for completing the HR3P-matrix and determining the demand for personnel by means of the PEST analysis, the EFE matrix, strategic objectives, scenario planning, and the occupation table. The HR advisor and/or the HR support employee were in charge of collecting the quantitative data regarding the current workforce. The researcher herself was responsible for calculating the supply of personnel and combining all information provided by the team leaders into the final outcome of the SPP process. The business manager had no active role in the first stages of the pilot implementation but assisted the team leaders were necessary and participated in the group interview to discuss the SPP process and the final outcome. In the following paragraphs, the findings of the group interview will be discussed.

6.1.1 HR3P-Matrix

Both team leaders completed the HR3P-matrix. They each developed several matrices: one for each function category. Although both team leaders agreed that it was difficult at first, once they were more familiar with the instrument it became easier to plot the employees on the matrix. One team leader mentioned that it was sometimes difficult to plot employees in one of the sixteen squares since some of the employees could be plotted in two squares.

The business manager mentioned that it might be possible to divide the matrix in two: the two columns on the left are fairly negative: employees in these columns are not performing the way you would want them to perform; the two columns on the right are more positive: employees in these columns are performing good or excellent and are important for the department.

All participants agreed that the HR3P-matrix provides a picture of the current workforce at this moment in time; it is possible (and even desirable in some cases) that the distribution of employees over the matrix is different next year. For example, there are people that currently do not perform well, which can be due to different reasons that affect a person at this moment in time but do not have an effect next year. Besides, new personnel might not be performing excellent because they have to grow in their current function. On the other hand, there are people that perform good or excellent now, but there may be an unforeseen event that causes their performance to drop. These factors make it important to view the HR3P-matrix as a snapshot of the current situation. Therefore, the HR3P-matrix should be completed every year. The business manager added to this that it would be ideal if the HR3P-matrix would be used for performance evaluation and the annual appraisal interviews. It could be a useful tool based on which employees can be evaluated and appraisal conversations can be held.

The business manager mentioned that although the HR3P-matrix is a useful tool to portray the quality of the current workforce, it is important to determine why people underperform. Thus, the outcome of the matrices needs to be analyzed. In addition, it is important to use criteria based on which personnel is plotted in one of the sixteen squares of the matrix. This helps validate the results and provides a basis upon which the outcome can be analyzed and actions can be taken. Therefore, it is worthwhile to combine the HR3P-matrix with the annual appraisal interviews and use similar criteria. However, the current appraisal interviews are not well suited for this purpose since they do not allow you to judge an employee based on criteria other than their job description. Both team leaders concurred with this and mentioned that they would like to evaluate the behaviour of the employees along with their competencies; they want to make clear what they expect of their employees and assess the personnel thereon.

Overall, all participants found the HR3P-matrix to be a useful tool. Both team leaders agreed that the outcome of the matrices confirmed their intuition and the feeling they had regarding the condition of the workforce. Both team leaders mentioned that they had an image in their mind regarding the performance of their employees, but that it is an eye-opener to see it on paper. The main benefit of the HR3P-matrix is, according to the participants, that it is simple to produce and that it provides a visual overview of the distribution of the workforce over the grid which makes it easy to interpret the results.

6.1.2 Supply of Personnel

The supply of personnel has been determined by the researcher herself. The HR support employee provided the necessary data to calculate the natural-outflow and the total outflow. The HR support employee noted that, although it was fairly simple to extract the necessary information from Beaufort, not all information in Beaufort regarding the current workforce was correct and up-to-date. Especially information regarding the outflow rates of previous years was difficult to obtain. For example, the data only showed the name of a person and the reason for exiting the organization. No information regarding his/her function or FTE was available. Therefore, the other-outflow-percentage calculated was an estimation based on data that was available.

Calculations regarding the natural-outflow were relatively easy to compute. During the group interview, one team leader mentioned that it would be important to closely monitor the outflow on

an individual level and compare this to the results of the HR3P-matrix to determine who flows out of the organization and whether this is desirable or not.

Overall, the participants of the group interview believed the supply prognosis to be an eye-opener and found it a useful tool to see what will happen when the organization does nothing to prevent any outflow (i.e. renew temporary contracts) or hires additional personnel.

6.1.3 Demand for Personnel

The team leaders used the PEST analysis en the EFE matrix to portray and measure the impact of influential external factors. First, they listed all external factors that can influence their department. Next, they rated the influence of these factors on their workforce. Both team leaders found it difficult to determine which external factors are present and what the impact of these factors would be on their demand for personnel.

The business manager suggested that it would be wise to create a PEST analysis with all team leaders within a division together, supervised by the business manager of the division. It was suggested that, for example, once a year all team leaders and the business manager come together and discuss the external environment and the influential factors. By doing this, the departments get a better understanding of the factors and it is possible to create a broad overview. After this meeting, all team leaders can individually (albeit with the help of the business manager and/or the HR advisor) create the EFE matrix in which they include only those factors that influence their department. Both team leaders agreed with this suggestion and mentioned that it is extremely difficult for the team leaders alone to generate the PEST analysis.

In general, all participants believed that the PEST analysis and the EFE matrix form useful tools to think about the external environment and determine the importance of the external factors. They understood that the outcome of the EFE matrix is not necessarily correct or all-inclusive; however, it provides the means to brainstorm and give direction to the decision making process.

Concerning the strategic objectives of the department, both team leaders created a list of topics and items which they believed were important for their department. These objectives were partly based on the annual plans of the department and partly on what they believed the main objectives of the organization to be. However, all participants mentioned that the corporate strategy of MST is unclear and too much focussed on the short-term. As previously mentioned, MST is currently in the process of developing a corporate strategy. All participants mentioned that this corporate strategy can be used as a starting point from where the objectives of the individual departments can be set.

The business manager suggested that it might be worthwhile to combine this step with the previous step: hold a meeting with all team leaders and the business manager of the division to generate the PEST analysis and discuss the strategic objectives of the organization as a whole, the division, and the individual departments. In addition, the objectives of the individual departments can be discussed during the sessions in which the annual plans are determined.

Scenario planning has not been implemented completely in the pilot implementation. Team leaders found it too difficult to use and did not see the additional benefits. The business manager believed

that it is sufficient to determine the demand for personnel by means of the strategic objectives and the PEST analysis and EFE matrix, thus omitting scenario planning.

Finally, estimating the demand for personnel was done based on the outcome of the EFE matrix (which included the PEST analysis) and the strategic objectives of the department. The team leaders found it very difficult to determine the demand for personnel and complete the occupation table. Prior to the group interview, the team leaders did not have much time to discuss this with the business manager. However, both the team leaders and the business manager believed that they should collaborate on this step, albeit only the first time they complete the occupation table. In addition, since the team leaders experienced some problems in creating the EFE matrix and listing the strategic objectives of the departments, determining the result of these processes in terms of the necessary personnel was difficult. During the group interview, however, the participants agreed that it would be possible to complete the occupation table if they did not have the sole responsibility of completing the before mentioned steps.

6.1.4 Overall SPP Process

In general, the participants were enthusiastic about the instruments and the SPP framework as a whole. They believed that each individual instrument has its own benefits and provides valuable information and insights. All instruments combined provide a clear picture of the current workforce and highlights problem areas and focus points. The business manager mentioned that the instruments offer the tools to portray the current situation, thereby increasing a sense of urgency. Overall, the participants feel that the SPP process should be a more collaborative effort. Especially the PEST analysis and setting the strategic objectives should be performed during a session in which all team leaders and the business manager of the department participate.

The business manager believes it to be worthwhile to start creating an image of the current workforce, with both the HR3P-matrix and the numbers regarding outflow. This can help determine what actions are necessary at the moment. Although this has a relatively short-term vision, the business manager argues that it provides the starting point and can be realized in a relatively short period of time. The next step would be the SPP system as developed here, albeit with some alterations, to include the long-term prospect and determine whether the personnel available in the future are in fact the personnel necessary in the future. It is believed by all participants that a clear picture is necessary of both the quantity as well as the quality of the supply of personnel in the future as well as the demand for personnel. By include evaluation criteria in the HR3P-matrix the quality of the personnel becomes visible. When the HR3P-matrix is compared to the outflow prognosis, it can be determined whether the workforce available in the future has the quality that is desired. Here, an important aspect involves assessing the HR3P-matrix and taking the necessary actions to alter the outcome towards the desired state (i.e. increase employees' performance).

6.1.5 Summary

The instruments of the preliminary SPP framework developed in Chapter 5 have been tested by means of a small scale pilot implementation. The HR3P-matrix was completed by the team leaders who were positive regarding the use of the instrument and found it a useful tool to portray the quality of the current workforce. The outflow prognosis combined with the completed HR3P-matrix

was perceived as an eye-opener illustrating what will happen when the organization does nothing to prevent any outflow or hires new personnel.

Determining the demand for personnel was more complicated than predicting the future supply of personnel. In particular, team leaders found it difficult to individually perform the PEST analysis and complete the EFE matrix. Therefore, it was suggested that the PEST analysis is completed by all team leaders of a division together, supervised by the business manager. This process can be combined with discussing the strategic objectives of the organization and the division. Next, each team leader identifies the strategic objectives and external factors relevant for his/her department and completes the EFE matrix and the summary of strategic plans. Scenario planning proved to be a difficult instrument to use. Team leaders are not familiar with the tool and do not see the benefits of using the instrument. Therefore, the demand for personnel in the future was based on the outcome of the EFE matrix and the strategic objectives of the departments. The team leaders that participated in the pilot study were not able to fully complete the occupation table. However, they believe that it would be possible to complete the instrument if they have been assisted in the process of creating the PEST analysis and discussing the strategic objectives.

Overall, the participants were enthusiastic about the instruments and the complete SPP framework. They believed that each instrument has its own benefits and that all instruments combined provide a clear overview by highlighting problem areas and focus points. The participants agreed that the perceived value of the SPP framework is that it creates awareness regarding the current situation and suggests actions that need to be taken to create the future workforce necessary to cope with external contingencies and the objectives of the organization.

6.2 *Final SPP Framework for MST*

Based on the findings of the pilot implementation and the group interview, the instruments of the refined SPP framework are altered and adjusted if necessary. The following paragraphs describe these changes to the SPP instruments resulting in the final SPP framework for MST.

6.2.1 Current Workforce

As previously described in Chapter 5, the personnel information system used by MST is Beaufort. This system has also been used during the pilot implementation and will remain part of the SPP framework for MST. However, not all information in Beaufort is up-to-date. Thus, it is important to make sure all information is correct prior to drawing conclusions based on this data.

During the pilot implementation, the human resource performance potential portfolio (HR3P-) matrix has proven to be a sufficient tool to portray the performance and growth potential of the current workforce. However, the instrument needs to be altered slightly based on the findings of the group interview. Prior to completing the HR3P-matrix, criteria need to be set based on which the performance of the employee can be judged. These criteria consist of competencies, skills, and behaviour that the organization requires from the employees. Ideally, these criteria are part of the new job descriptions that are currently being developed by MST (this is elaborated on in Chapter 7). These criteria must be communicated to the personnel so they know what is expected of them and

can strive to act accordingly. Adding criteria to the HR3P-matrix helps validating the results and enables the team leader to use the matrix as a basis upon which the appraisal interviews are held.

Although it is not part of strategic personnel planning, an additional process resulting from the HR3P-matrix involves determining why people were plotted in a certain square of the matrix, and taking actions thereon if necessary. The before mentioned criteria increase the possibilities to determine why people underperform (i.e. they do not meet one or more of the criteria) and suggests what actions need to be taken (i.e. which criteria need attention).

6.2.2 Supply of Personnel

Throughout this research, the instruments suggested to measure the personnel available in the future have changed several times. The preliminary SPP framework included the Markov model and the performance and potential (P&P) matrix; the refined SPP framework included the outflow prognosis. During the group interview it became apparent that these two options needed to be combined. Therefore, the final SPP framework includes both the outflow prognosis (including the natural-outflow and other-outflow-percentage) as well as the P&P matrix.

The HR3P-matrix and the similar P&P matrix have been excluded from the refined SPP framework developed in Chapter 5 since it was believed that these matrices were not able to forecast the quality of the future workforce. However, during the pilot implementation it became apparent that the HR3P-matrix can be combined with the natural-outflow prognosis to determine the quality of the people that flow out of the department, thereby providing valuable insights and issues upon which actions can be taken. During the group interview it was suggested that the HR3P-matrix can be simplified to provide a clearer picture of the performance and potential within the department. Therefore, the P&P matrix, as described in Section 3.2.3.2, will be included in the final SPP framework as a tool to provide a clear picture of the distribution of the performance and potential of the employees in a department. The P&P matrix cannot display the changes of employees over time, in terms of quality. Rather, when the completed matrix is combined with the natural-outflow prognosis, it can be determined what the quality is of the employees that will flow out of the department, thus what quality will leave the department. The P&P matrix divides the sixteen squares of the HR3P-matrix into four squares labelled: problem children, eager learners, solid citizens, and rising stars. In Chapter 3 it was suggested to use the total number of people within a cell rather than names of personnel to complete the P&P matrix. However, since the purpose is to combine the outcome of the matrix with data from the natural-outflow prognosis to consider the outflow on an individual level, the names of employees or personnel numbers need to be used in the matrix to be able to link the outcome to the natural-outflow prognosis.

The prognosis of the future outflow will be determined by means of the natural-outflow and other-outflow-percentage, as described in Chapter 5. Although during the pilot implementation it became apparent that the data in Beaufort needs to be updated, these instruments provide a clear tool to portray the expected outflow in the upcoming years. In the refined SPP framework described in Chapter 5, the quality of the future personnel was determined by distinguishing between different functions based on the FWG system. This aspect will remain part of the final framework for MST.

In conclusion, to forecast the future supply of personnel the outflow prognosis will be used, consisting of the natural-outflow and the other-outflow-percentage, together with the P&P matrix.

6.2.3 External Environment & Corporate Strategy

To portray and assess the influential external factors the PEST analysis together with the EFE matrix was included in the preliminary and refined SPP framework for MST. Based on the findings of the pilot implementation a small change is made to the EFE matrix: two columns are added to portray the effect the factor has on the workforce and the function group the factor affects (similar to the table used to summarize the strategic objectives). By including these columns, the outcome of the EFE matrix can better be combined with the summary of the strategic objectives.

Summarizing the strategic objectives of the department that influence the workforce remains part of the final SPP framework for MST, although a small change is made to the instrument. Previously, the strategic objectives of the department were merely summarized in a list. To create a complete overview that is similar to the EFE matrix, a new table will be inserted to illustrate the effect of the objectives on the workforce and function group. This new table will be referred to as the strategic objectives table. Thus, to assess the strategic objectives of the department and the influence thereof on the workforce of the department, the first step includes setting or summarizing the strategic objectives of the division based on which each individual team leader creates the strategic objectives table.

In addition to the above mentioned change to the EFE-matrix, some changes are made regarding the process of performing the PEST analysis and summarizing the strategic objectives. During the pilot implementation, the individual team leaders were responsible for conducting the PEST analysis and drawing a list of strategic objectives. However, in the group interview it became apparent that it is too difficult for the team leaders to do this alone. Therefore, it is suggested that all team leaders that are part of a division create the PEST analysis and strategic objectives together, directed by the business manager. During a meeting or workshop session the environmental factors influencing the division and the strategic objectives of the organization and the division are listed and discussed. Next, from the PEST analysis created during the workshop session, each team leader selects the factors that are relevant for his/her department and completes the EFE matrix for these factors. In addition, each team leader translates the division's strategic objectives into objectives and plans for his/her department. The business manager and HR advisor assist the team leaders in these processes.

The before mentioned workshop session can also be used in the development of the annual plans that each department is required to create on a yearly basis. Since the annual plans cover the same aspects as those necessary as input for the SPP framework (i.e. corporate strategy; division's strategy; department's strategy), the two processes can be linked to each other to increase the efficiency of the processes.

In the development of the refined SPP framework, the EFTE-method was included as an option: it was left to the people involved whether to use the EFTE-method or not. The group interview revealed that none of the participants used the EFTE-method; they preferred to use common meetings, as described above, to discuss the external environment and strategic plans and believe

the outcome of those meetings is of a higher quality compared to an outcome generated by the EFTE-method. Therefore, the EFTE-method will no longer be part of the final SPP framework.

To summarize, during a meeting with all team leaders and the business manager, the PEST analysis is created and the strategic objectives are listed and discussed. After this meeting, each individual team leader creates the EFE matrix and summarizes the strategic objectives that influence the demand for personnel within his/her department. The business manager and HR advisor support the team leaders throughout these processes.

6.2.4 Demand for Personnel

In the preliminary SPP framework, scenario planning was included as a tool to explore the combined impact of different factors affecting the workforce of a department. Based on the outcome of scenario planning, the occupation table was to be completed where the strategic objectives and scenarios were translated into the demand for personnel in the future. However, the pilot implementation showed that scenario planning can be a difficult tool to use properly. Besides, since team leaders find this tool difficult to use, it is unlikely that it will yield a realistic outcome. The group interview showed that the people involved rather omit scenario planning and base the demand prognosis on the outcome of the EFE matrix and the summary of the strategic objectives. Therefore, scenario planning will not be included in the final SPP framework for MST.

The occupation table has been part of the preliminary SPP framework and can be used to translate the findings of the EFE matrix and strategic objectives into a forecast for the demand for personnel. Thus, based on the outcome of the EFE matrix and the summary of strategic objectives, each team leader determines what the effect of the factors and objectives is on the demand for personnel in the future. Although the team leaders need to be assisted by the business manager and/or the HR advisor of the division, the group interview showed that it is possible for the team leaders to complete the occupation table.

Concluding, the prognosis for the demand for personnel will be made by means of the occupation table based on the outcome of the EFE matrix and the strategic objectives.

6.2.5 Fit

The fit table has been included in the preliminary and the refined SPP framework as a means to determine the fit between the supply of and demand for personnel in the future. The fit table included in the preliminary framework has been altered slightly to be used in the refined framework. The fit table to be part of the final SPP framework for MST is the same as used in the refined framework, described in Section 5.3.6.

6.2.6 Actions

In the preliminary SPP framework, suggestions have been added regarding the actions that can be taken to overcome a gap between the supply of and demand for personnel in the future. These suggestions included creating an organization wide overview of all departments combined, and the use of the HR3P-matrix. These suggestions remain the same and will be incorporated in the final SPP framework for MST.

6.2.7 Summary

During the pilot implementation, the instruments have been put into practice allowing the usability, practicality, and feasibility of the instruments to be assessed. Based on the findings of the pilot implementation and the group interview, several changes have been made to the refined SPP framework for MST. Some instruments that were selected in the refined framework have been excluded from the final SPP framework since the pilot implementation showed that these instruments are not suitable to be used in the current setting of MST. For example, scenario planning has been omitted since end-users found it difficult to use the instrument and do not see the additional benefit. The EFTE method has also been excluded from the framework since team leaders and managers prefer to use meetings and workshop sessions as qualitative methods.

The P&P matrix was part of the preliminary selection of instruments but was, due to the lack of additional benefits, excluded from the refined framework. However, the pilot implementation showed that the P&P matrix can be a useful tool in determining the quality of the personnel available in the future. Therefore, the P&P matrix has been included in the final framework for MST. In addition, the strategic objectives table has been included to structure the summary of strategic objectives. By altering the layout of the EFE matrix, the outcome of the EFE matrix has the same representation as the outcome of the strategic objectives table. This makes the outcomes easier to interpret and simplifies the process of creating the occupation table.

Table 17 summarizes the changes to the refined SPP framework and enumerates the instruments included in the final framework.

	Refined Framework	Changes	Final Framework
Current Workforce	Beaufort	No changes	Beaufort
	HR3P-matrix	Clearly set and define criteria	HR3P-matrix
Supply Prognosis	Total outflow	No changes	Total outflow
	-	Instrument included in the final framework	P&P matrix
External Environment	PEST analysis	Perform analysis during group meeting	PEST analysis
	EFE matrix	Include two more columns in table	EFE matrix
	(EFTE method)	Excluded from the final framework	-
Corporate Strategy	(EFTE method)	Excluded from the final framework	-
	Strategic objectives	Specify the strategic objectives of the division.	Strategic objectives
		Instrument included in the final framework.	Strategic objectives table

Demand Prognosis	Scenario planning	Excluded from the final framework	-
	Occupation table	No changes	Occupation table
Fit	Fit table	No changes	Fit table
Actions	Organization wide overview	No changes	Organization wide overview
	HR3P-matrix	No changes	HR3P-matrix

Table 17 - Summary Changes to Refined SPP Framework

6.3 Conclusion

The instruments of the refined SPP framework described in Chapter 5 have been tested on their usefulness, practicality, and suitability. The previous paragraphs described the pilot implementation and the main findings thereof. During the pilot implementation, it became apparent that some of the SPP instruments were simple and straightforward while others were difficult to use. Based on the findings of the pilot implementation, which has been assessed via a qualitative group interview, some of the instruments have been altered, adjusted, or excluded from the SPP framework.

Figure 7 illustrates the SPP framework developed for MST along with the instruments that have been selected. The final SPP framework shows some resemblance to the preliminary SPP framework: some of the instruments that were part of the preliminary selection remain part of the final framework. On the other hand, some new instruments have been added while others have been adjusted based on the findings of the interviews and the pilot implementation.

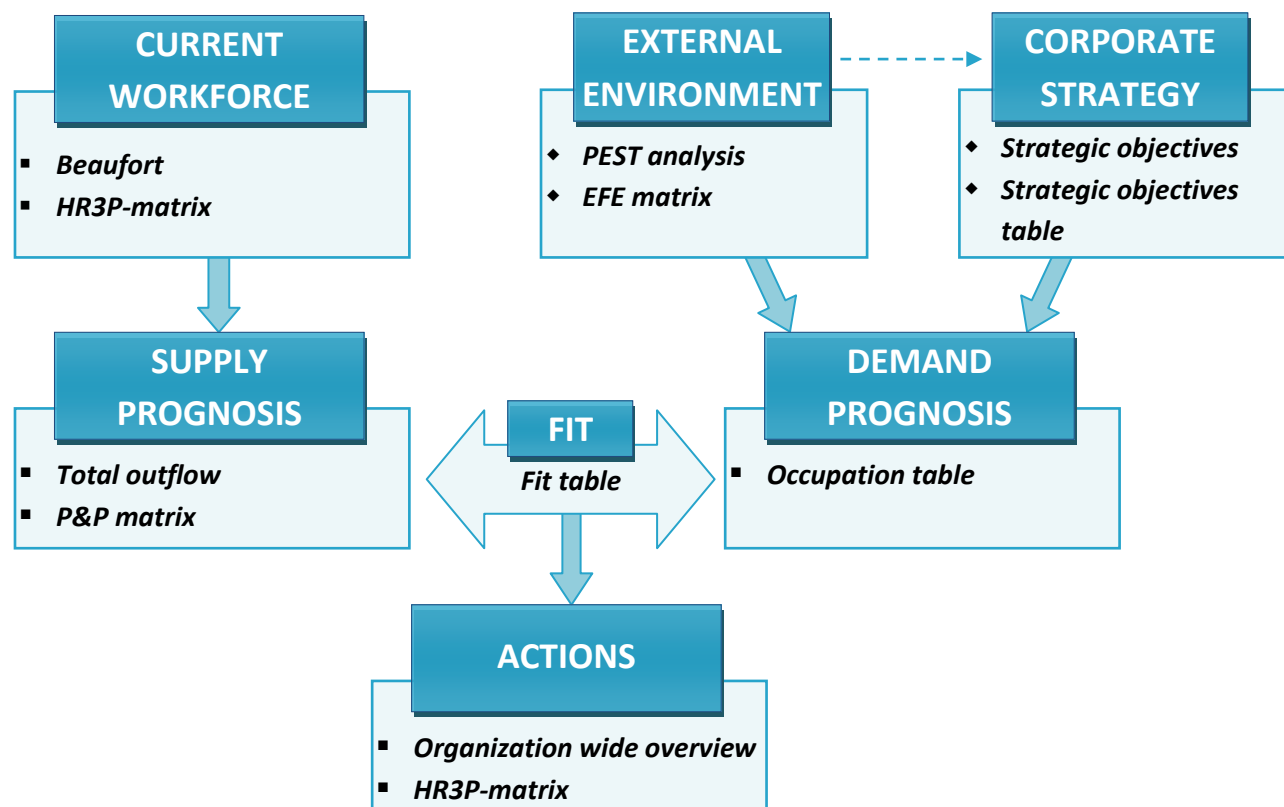


Figure 7 - Final SPP Framework

The pilot implementation was the last step in the development of the SPP framework for MST. From the preliminary selection of instruments made by means of a literature study, the instruments and the overall framework have been assessed, evaluated, and tested to create the final SPP framework tailored to the current needs and requirements of MST.

To summarize the final SPP framework, Table 18 provides an overview of the different instruments along with the required input, the generated outcome, and the persons responsible for working with the instruments. This table appears similar to Table 14 (see Chapter 3) and Table 16 (see Chapter 5). Table 14 was used to summarize the instruments that formed the preliminary SPP framework. Table 16 summarized the instruments of the refined SPP framework. Table 18 displays the instruments of the final SPP framework. Thus, although the layout of the tables is similar, the instruments differ. There are resemblances between the before mentioned tables since there are similarities between the instruments included in the preliminary, the refined, and the final SPP framework. Differences can be found in the instruments selected to portray each of the sections of the SPP process. Also the persons responsible for working with the instruments vary from table to table. As previously mentioned, these changes have been made based on the findings of the data collection procedures.

Section	Instrument	Input	Output	Responsible Persons		
				Team leader	Business manager	HR advisor
Current Workforce	Beaufort	Information per employee: year of birth; type of contract; FTE; function (FWG).	Overview general information of all employees in a department			X
	HR3P-matrix	Current performance & growth potential per employee per category	Overview of performance and potential of the workforce per category per department	X		
Supply Prognosis	Natural-outflow	Output of Beaufort	Overview of natural-outflow expected in upcoming years			X
	Other-outflow-percentage	Outflow rates of pervious year(s)	Overview of other-outflow percentage expected in upcoming years			X
	Total outflow	Natural-outflow & other-outflow-percentage	Overview of all expected outflow in upcoming years			X
	P&P matrix	HR3P-matrix of current workforce	Overview of quality of current workforce; to be compared with natural-outflow	X		
External Environment & Corporate Strategy	PEST analysis	Data concerning external factors (political, economic, socio-cultural, technological factors)	Overview of external factors	X	X	X
	EFE matrix	PEST analysis	Overview of external factors and their importance to the human resources of a department	X	X	X
	Strategic objectives	Corporate strategy	Summary of division's strategic objectives	X	X	X
	Strategic objectives table	Strategic objectives of the division	Summary of department's strategic objectives and influence on the human resources of the department	X	X	X
Demand Prognosis	Occupation table	Strategic objectives table & EFE matrix	Overview of personnel required in the future	X	X	X
Fit	Fit table	Total outflow & occupation table	Fit between supply and demand in the future	X		X
Actions	HR3P-matrix	HR3P-matrix concerning the current workforce	Suggestions who can be promoted/transferred	X	X	X
	Org.-wide overview	Completed SPP framework of all departments	Overview of shortages/surpluses per function category			X

Table 18 - Overview Instruments Final SPP Framework

7. THE SPP FRAMEWORK FOR MST EXEMPLIFIED

Throughout the report, the initially selected SPP instruments have been altered and adjusted based on the outcomes of the interviews and the pilot implementation. To provide a clear overview of all instruments that are part of the SPP framework, the complete SPP process and the instruments will be described in the following sections.

In order to illustrate the instruments, examples will be provided where fictional data is used. The data represented in the examples has been created merely for the purpose of illustrating the instruments and does not portray information regarding a department of MST.

7.1. *Current Workforce*

The starting point of strategic personnel planning concerns portraying the current workforce. Since part of the future workforce is currently employed, it is important to determine what the quantity and the quality of the current workforce is. To portray the relevant quantitative data, the personnel information system Beaufort is used. The quality of the current workforce is displayed in an HR3P-matrix.

7.1.1 Beaufort

Beaufort is the personnel information system used by MST and contains all information regarding the employees. For the purpose of SPP the following data needs to be collected for each individual employee within a department: the date of birth; the type of contract (i.e. permanent or temporary); the end-date of the contract (if applicable); the fulltime equivalent (FTE); and the function. This information needs to be collected per department. Flex-workers and employees temporarily hired via an employment agency are not to be included in the analysis. Information regarding outflow in the previous years needs to be gathered, if available.

7.1.2 HR3P-Matrix

The human resource performance potential portfolio (HR3P-) matrix, developed by Evers, Van Laanen, and Sipkens in 1993 (as cited in Evers & Verhoeven, 1999), is a tool to portray the quality of the current workforce in terms of growth potential and current performance.

For each function category within a department, one HR3P-matrix is to be completed. Each individual employee is plotted in one of the sixteen squares of the matrix, based on the employee's current performance and his/her potential to grow. Determining the current performance of the employee is based on criteria which need to be set prior to completing the HR3P-matrix. The table below provides an example of a completed HR3P-matrix. The numbers in the example represent (fictional) personnel numbers.

		Current Performance				Total
		Insufficient	Sufficient	Good	Excellent	
Potential	Reached full potential	0101/ 0102/ 0103	0104 / 0105 / 0106 / 0107 / 0108 / 0109 / 0110 / 0111 / 0112	0113 / 0114 / 0115 / 0116 / 0117 / 0118 / 0119 / 0120 / 0121		21
	Has potential to grow within current function		0122 / 0123 / 0124 / 0125 / 0126	0127 / 0128 / 0129 / 0130 / 0131 / 0132 / 0133	0134 / 0135	14
	Can be promoted in the short term (1-3 years)			0136 / 0137 / 0138		3
	Can be promoted now		0139 / 0140			2
Total		3	16	19	2	40

Table 19 - Example HR3P-matrix

7.2 Supply of Personnel

After collecting the necessary information regarding the current workforce, a prognosis for the personnel available in the future (i.e. 3 years) can be made. The prognosis aims to determine what will happen with the current workforce if nothing would change (e.g. no change in policy; no inflow; no contracts are renewed). First, based on the data obtained from Beaufort, estimations can be made regarding the outflow that is likely to occur over the next three years. Next, the performance and potential (P&P) matrix can be compared to the outflow prognosis to determine the quality of the personnel that is likely to flow out of the organization.

7.2.1 Outflow

To determine the quantity of the personnel available in three years, prognoses regarding outflow must be made. Since the supply of personnel is determined per function category per department, thus treating each department separately, a distinction between different outflow destinations is not made. This means that it does not make any difference whether the employee moves to another department or whether the employee leaves the organization, it is both regarded as outflow.

Making the outflow prognosis consists of two steps: first, the natural-outflow is determined including outflow caused by retirement and temporary contracts that end; second, the other-outflow is calculated in the form of a percentage representing outflow that might occur due to any reason except natural-outflow. The natural-outflow can be calculated with reasonable certainty; the other-outflow-percentage, on the other hand, is an estimation and may not be completely accurate.

The natural-outflow is calculated by filling in the details per employee per department in an Excel sheet. The necessary data consists of the information extracted from Beaufort as has been described previously. Simple formulas in the Excel document can calculate how many FTE flows out of the department based on the year of birth of the employee (to determine the outflow due to retirement)

and the end-date of the contract (to determine the outflow caused by temporary contracts that end). The other-outflow-percentage represents the probability that employees flow out of the department and can be calculated based on trends of the past year(s). By combining the natural-outflow with the other-outflow-percentage, an overview can be created of the total outflow per year, per function category as shown in the example below.

Retirement age (average)	62
Other-outflow-percentage	4,71%

Current workforce		2013			2014			2015		
Function category	current FTE	natural outflow	other outflow	rest	natural outflow	other outflow	rest	natural outflow	other outflow	rest
Student HBO-V	1,56	0,78	0,00	0,78	0,78	0,00	0,00	0,00	0,00	0,00
Ward assistant	2,11	0,00	0,10	2,01	0,00	0,09	1,92	0,00	0,09	1,83
Administrative assistant	1,11	0,00	0,05	1,06	0,00	0,05	1,01	0,00	0,05	0,96
Trainee	1	1,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Nurse	25,71	4,44	1,21	20,05	1,11	0,95	18,00	0,67	0,85	16,48
Nutrition assistant	1,56	0,44	0,07	1,04	0,00	0,05	0,99	0,00	0,05	0,95
Carer	1,14	0,00	0,05	1,09	0,00	0,05	1,04	0,61	0,05	0,38
Total FTE	34,19	6,67	1,49	26,03	1,89	1,19	22,95	1,28	1,08	20,59

Table 20 - Example Outflow Prognosis

7.2.2 P&P Matrix

The performance and potential (P&P) matrix is an instrument similar to the HR3P-matrix. After completing the HR3P-matrix the sixteen cells can be grouped into four cells, as shown in the example below:

		Current Performance				Total
		Insufficient	Sufficient	Good	Excellent	
Potential	Reached full potential	0101/0102/0103 Problem Children	0104/0105/0106/ 0107/0108/0109/ 0110/0111/0112	0113/0114/0115/ 0116/0117/0118/ 0119/0120/0121 Solid Citizens		21
	Has potential to grow within current function		0122/0123/0124/ 0125/0126	0127/0128/0129/ 0130/0131/0132/ 0133	0134/0135	14
	Can be promoted in the short term (1-3 years)			0136/0137/0138		3
	Can be promoted now		0139/0140 Eager Learners		Rising Stars	2
Total		3	16	19	2	40

Table 21 - Example P&P Matrix

Next, the P&P matrix is compared with the outflow prognosis to determine the quality of the personnel that flows out and, ultimately, the quality that remains within the department. This matrix,

together with the HR3P-matrix, provides the basis upon which additional actions can be taken to increase the quality of the current and future workforce.

7.3 External Environment & Corporate Strategy

The demand for personnel can be determined based on changes in the external environment and the strategic objectives of the organization and the individual departments. The PEST analysis, the EFE matrix, and a summary of the strategic objectives of the department are means to guide the process of determining what personnel is necessary in the future.

7.3.1 PEST Analysis

First, the environmental factors influencing the organization need to be specified by means of a PEST analysis. The PEST analysis looks at the political, economic, socio-cultural, and technological factors in the external environment of the organization. The analysis can be performed during a meeting or workshop session with all team leaders of a division, supervised by the business manager. During this meeting, all external factors that can affect the demand for personnel are listed and discussed.

7.3.2 EFE Matrix

From the PEST analysis described above, each team leader creates the EFE matrix for his/her department, including only those factors that are relevant for his/her department. The EFE matrix is a tool to help determine the importance and influence of the external factors. Although each team leader within a division is responsible for completing the EFE matrix, the business manager (and perhaps the HR advisor) should assist the team leaders where necessary. The table below is an example of the completed EFE matrix.

External Factors	Effect on personnel (more/less/different/ no change)	Function category	Weight	Rating	Weighted Score
Political					
1. A	no change	all	0,07	2	0,14
2. B	less	all	0,05	4	0,20
3. C	more	nurses	0,10	3	0,30
Economic					
1. D	less	all	0,08	2	0,16
2. E	no change	all	0,05	1	0,05
3. F	different	nurses	0,15	2	0,30
Socio-cultural					
1. G	more	all	0,12	4	0,48
2. H	different	carers	0,08	3	0,24
3. I	more	nutr. assistants	0,15	2	0,30
Technological					
1. J	no change	nutr. assistants	0,10	1	0,10
2. K	more	nurses	0,04	2	0,08
3. L	less	adm. assistants	0,01	3	0,03
Total			1,00		2,38

Table 22 - Example EFE Matrix

To complete the EFE matrix, first it is established what the predicted effect on the workforce of the department is, which is specified per function category. Next, each factor is assigned a weight

representing the relative influence of each factor on the human resources of the department. The weights range from 0.0 (no influence) to 1.0 (extremely influential). The sum of all weights must equal 1.0. Next, each factor is assigned a rating representing how well the department is coping with the external factor. Here, ratings range from 1 to 4, where 1 indicates that the current workforce of the department is coping superiorly with the external factor (meaning that no changes in the workforce are necessary to cope with the factor); a score of 4 indicates that the current workforce of the department is not at all capable of coping with the factor. After weighting and rating each factor the weight and rating are multiplied, resulting in the weighted score. The higher the weighted score, the more actions need to be taken.

The EFE matrix is not necessarily correct or all inclusive; it is a tool to give direction to the decision making process. For example, in the table above, external factor G is highly important: the weight of 0.12 indicates that this factor has much influence on the department's workforce; the rating of 4 indicates that the current workforce is not able to cope with the factor. Thus, the department needs to be well aware of this factor and adjust its workforce to be able to cope with it.

7.3.3 Strategic Objectives

The corporate strategy forms the basis from which the strategic objectives of the division are set. During a meeting with all team leaders of a division, supervised by the business manager and the HR advisor of the division, the strategic objectives of the division are specified and summarized. This meeting can be combined with the meeting discussed above to create the PEST analysis.

7.3.4 Strategic Objectives Table

After jointly determining the strategic objectives of the division, each team leader, guided by the business manager and HR advisor, sets the strategic objectives for his/her department and completes the strategic objectives table. For the purpose of SPP, special attention must be paid to the influence of the strategic objectives on the workforce of the department (i.e. is additional/less/other personnel needed?). Table 23 illustrates an example of the strategic objectives table.

Strategic objectives (up to and including 2015)		Effect on personnel (more/less/different)	Function category
1.	U	less	all
2.	V	less	nutrition assistants
3.	W	different	nurses
4.	X	less	administrative assistants
5.	Y	less	carers
6.	Z	more	nurses

Table 23 - Example Strategic Objectives Table

7.4 Demand for Personnel

The EFE matrix and the strategic objectives table provide an overview of the external factors and strategic objectives that influence the workforce necessary in the future. These instruments serve as guidelines based on which it can be determined what personnel is required over three years. To complete the prognosis, the occupation table is used.

7.4.1 Occupation Table

The occupation table is a simple table used to portray the necessary FTE per function category. The influential external forces and strategic plans are translated into a prognosis of the personnel necessary to cope with the external factors and meet the objectives of the department and the organization. The following table provides an example of the completed occupation table.

Function category	Demand for personnel up to and including 2015 (in FTE)
Student HBO-V	1,5
Ward assistant	2
Administrative assistant	0,75
Trainee	1
Nurse	27
Nutrition assistant	1,56
Carer	1
Nurse practitioner	1
Total FTE	35,81

Table 24 - Example Occupation Table

7.5 Fit between Supply and Demand

After determining the demand for and supply of personnel in the future, the two need to be compared. This is done via the fit table which presents a numerical overview and provides the final outcome of the SPP processes. An example of the fit table is shown below.

Function category	Current workforce (in FTE)	Outflow until 2015 (in FTE)	Future supply (in FTE)	Future demand (in FTE)	Fit (in FTE)
Student HBO-V	1,56	1,56	0,00	1,50	-1,50
Ward assistant	2,11	0,28	1,83	2,00	-0,17
Administrative assistant	1,11	0,15	0,96	0,75	0,21
Trainee	1,00	1,00	0,00	1,00	-1,00
Nurse	25,71	9,23	16,48	27,00	-10,52
Nutrition assistant	1,56	0,61	0,95	1,56	-0,61
Carer	1,14	0,76	0,38	1,00	-0,62
Nurse practitioner	0,00	0,00	0,00	1,00	-1,00
Total FTE	34,19	13,59	20,60	35,81	-15,21

Table 25 - Example Fit Table

The first column of the fit table represents the current workforce; the second column portrays the total outflow until 2015. This information is extracted from the outflow prognosis created to determine the supply of personnel in the future, which is represented in the third column of the fit table. The fourth column of the table represents the future demand and is extracted from the occupation table. The final column represents the difference between the future supply and future demand.

These data are fictional and have been inserted solely to provide an illustration of the instruments. However, would these be actual data of an existing department, some conclusions can be drawn regarding the outcome. For example, when looking at the nurses there are currently 25.71 FTE. Over the next three years (2013, 2014, and 2015), approximately 9.23 FTE flow out of the department. The demand for nurses in 2015 is estimated to be 27 FTE, meaning that there is an expected gap of 10.52 FTE. Thus the replacement demand is 10.50 FTE. It must be kept in mind that this gap can partly be overcome by renewing temporary contracts, if desired. In addition, these numbers are merely a prognosis to highlight issues and possible problems; it cannot be concluded with full certainty that these numbers are correct.

7.6 Actions

The fit table described above provides the final outcome of the SPP process. After determining the fit between the supply of and demand for personnel in the future, actions can be taken to overcome the gap. Although the actions to be taken are not part of the SPP process, the instruments used provide some suggestions for actions. First of all, the outcome of all departments within MST should be combined in order to compare the outcomes and determine whether there are opportunities regarding internal flow and relocating employees. Next, the HR3P-matrix can be used to determine which employees might be suitable to be transferred to another function in case there is an overcapacity in one function category and an under capacity in another position.

8. CONCLUSIONS & RECOMMENDATIONS

The purpose of the current study is to provide knowledge and information regarding strategic personnel planning, develop a SPP framework for Medisch Spectrum Twente, and formulate recommendations with regard to the implementation of the SPP framework and its instruments within MST. The following central research question guided the research:

Which instruments should be included in the strategic personnel planning framework for Medisch Spectrum Twente and how can the organization implement this framework?

Throughout the previous chapters, data has been collected to answer the central research question. First, a theoretical background has been developed in Chapter 2, where the different instruments and methods for SPP have been identified, followed by the selection of instruments to form a preliminary SPP framework, which is illustrated in Chapter 3. Next, the preliminary SPP framework has been adjusted based on the outcomes of interviews with end-users of the instruments and HR personnel of Santeon hospitals, resulting in the refined SPP framework described in Chapter 5. The final step of the research consisted of a pilot implementation where all instruments that are part of the refined SPP framework were put into action and tested based on their applicability and user friendliness. The final product of this research consists of a final SPP framework for MST, which has been clarified by use of examples in the previous chapter.

The actual implementation of the SPP framework within MST falls outside the scope of this research. However, throughout this research input has been collected based on which recommendations regarding the implementation can be provided. In addition, this research strived to build a foundation for the actual implementation of the framework.

In the following sections the central research question will be answered. In Section 8.1, a brief description of the final SPP framework developed for MST will be given, thereby providing an answer to the first part of the central research question: *which instruments should be included in the strategic personnel planning framework for Medisch Spectrum Twente*. Next, recommendations will be provided regarding the implementation of the SPP framework and its instruments, thus answering the second part of the central research question: *how can the organization implement this framework*.

8.1 The SPP Framework for MST

The SPP process consists of five steps: (1) portray the current workforce; (2) translate the current workforce into a prognosis of the personnel available in the future; (3) identify external forces and strategic objectives of the organization; (4) determine the future demand for personnel; and (5) compare the supply of personnel with the demand for personnel. The fit between the future supply of and demand for personnel can be overcome by means of, for example, HR policies regarding inflow, internal flow and development, and outflow. Combining these five steps with definitions found in the literature, strategic personnel planning is defined as: the process of determining the

quantity and quality of the future personnel required and the future personnel available in order to timely signal any differences between the supply and demand in the future, allowing an organization to implement HR policies with regard to the inflow, through flow, and outflow of personnel in order to effectively and efficiently allocate the workforce to meet the strategic objectives of the organization and cope with environmental contingencies and pressures. The SPP framework developed in the current study aims to measure and portray each of the steps described above. After determining the fit between the supply of and demand for personnel (step 5), actions can be taken to overcome any discrepancies between the supply and demand. Although two possible actions have been prescribed in this report, specific actions regarding HR policies concerning inflow, internal flow, and outflow have not been discussed since this is not part of the SPP framework. The outcome of the SPP framework consists of the fit table. Next, it is the HR department's responsibility to decide what to do with the outcome and determine which actions need to be taken.

To create an SPP framework tailored to the current needs and requirements of MST, several criteria were set regarding the individual instruments. Above all, the instruments need to be as simple, straightforward, and practical as possible. Throughout this research, these criteria have formed the guidelines for selecting the instruments and, ultimately, creating the SPP framework for MST.

The final SPP framework that has been created for MST consists of a number of individual instruments. To portray the current workforce, the personnel information system Beaufort is used together with the HR3P-matrix to portray the quality of the current workforce. Next, data regarding the current workforce is translated into a supply prognosis by means of the total outflow instrument and the P&P matrix. A PEST analysis is used to gather information regarding influential external factors which are assessed by means of the EFE matrix. The effects of the strategic objectives of a department on the required workforce are identified in the strategic objectives table. By combining the outcome of the EFE matrix with that of the strategic objectives table, the occupation table can be completed resulting in the prognosis for the demand for personnel in the future. The supply prognosis is combined with the demand prognosis in the fit table in order to determine whether there is a fit between the personnel available in the future and the personnel required in the future. Any discrepancies can be overcome by means of (HR) actions.

Figure 8 provides an overview of all instruments of the SPP framework for MST, together with the workings of the instruments and their interrelationships.

It must be kept in mind that strategic personnel planning is not straightforward bookkeeping; although the overall process produces numbers, it cannot be concluded that those numbers are fully correct since they are based on estimates and uncertainties. The main purpose of strategic personnel planning is to create awareness about the current and future state of the workforce and the effects of internal and external factors on the workforce, thereby highlighting bottlenecks and problem areas.

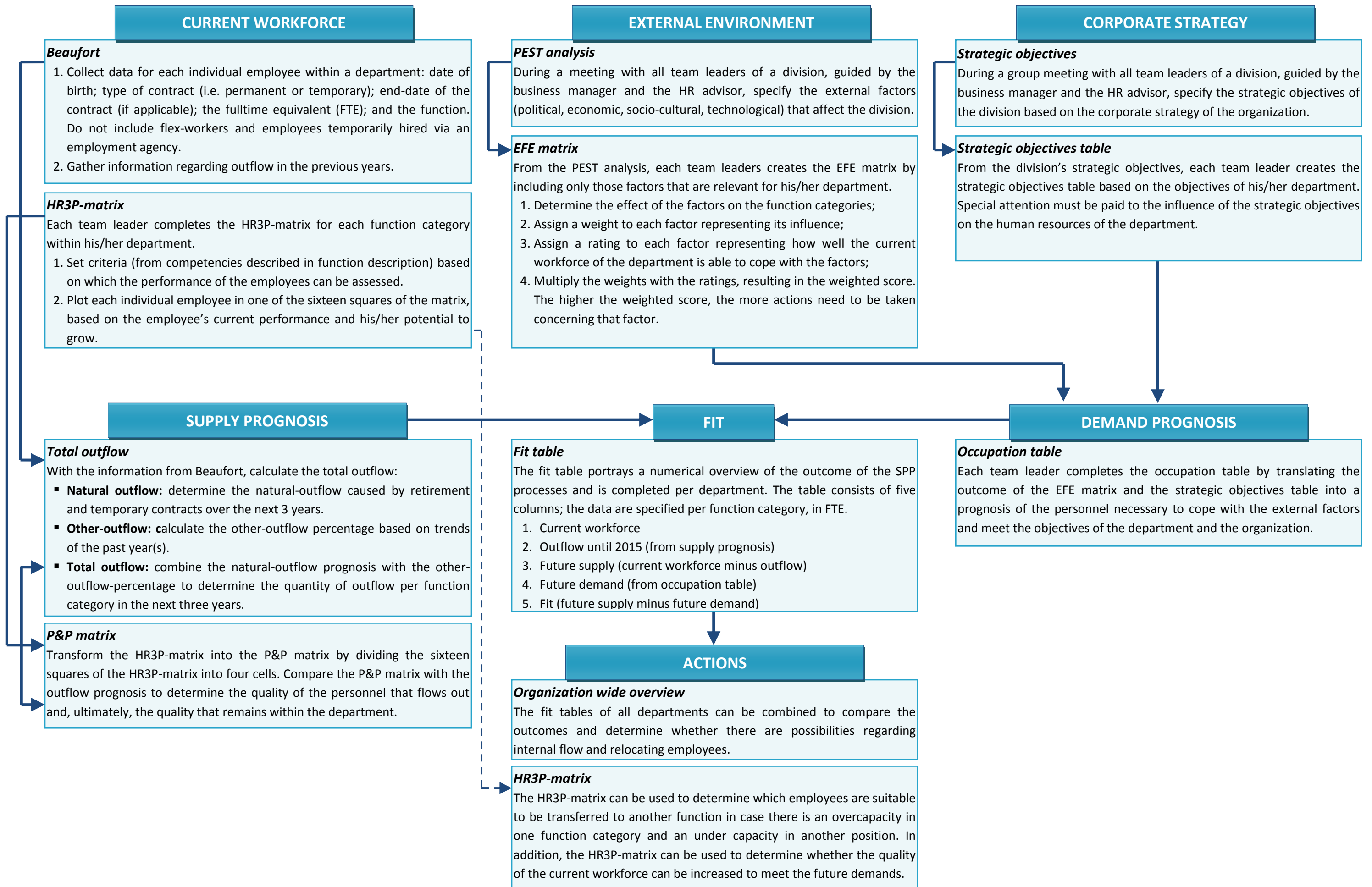


Figure 8 - Overview Workings and Interrelations SPP Instruments

8.2 Recommendations for Implementing the SPP Framework

The first part of the central research question aimed to determine which SPP instruments are most suitable for MST. The last part of the central research question focuses on the implementation of the SPP framework and its instruments. Although the actual implementation of the SPP framework falls outside the scope of the current research, recommendations can be made regarding the implementations. Throughout this project, information regarding the implementation of the SPP framework has been collected. These recommendations will be elaborated on in the following sections.

8.2.1 General Remarks

Prior to discussion the recommendations with regard to the implementation of the SPP framework and its instruments, there are some points that need to be addressed.

8.2.1.1 Central Coordination, Decentralized Planning

To recall: MST is made up of 7 clinical divisions and several staff departments of which the HRM department is one. The clinical divisions are managed by a business manager and a medical manager, who are assisted by a HR advisor. Each clinical division consists of multiple result oriented units (RVE), which consist of various departments. The departments are managed by team leaders.

The SPP instruments are designed to be implemented at the departmental level, meaning that each team leader is responsible for completing the instruments within his/her department. The business manager can assist the team leaders when necessary, specifically regarding the strategic issues and external environment. The HR advisor of the division coordinates the entire SPP process for all departments within that division. Central coordination is necessary to bring all information together into an organization wide overview. Therefore, one employee (or a team of employees) from the HR policy department is to be responsible for centrally coordinating the project. Evers and Verhoeven (1999) stress the importance of central coordination and decentralized planning and suggest that the actual implementation of the individual instruments should take part at the lowest possible organizational level.

Thus, the SPP process should be centrally coordinated; the implementation of the instruments and the SPP systems is decentralized. This has several reasons: (1) it is impossible for the HRM department to perform SPP for all departments since there are close to 100 departments; (2) the team leaders and business managers are likely to know best what influences their department; (3) it is not merely a tool for HRM (Nkomo, 1988), it is a tool to assist team leaders and business managers to create an overview of their current workforce and their future workforce; and (4) without central coordination teams develop their own tools and instruments, resulting in a lack of support for the overall SPP system.

8.2.1.2 Function Categories

Most instruments used for SPP require the workforce of a department to be divided into categories. To simplify the process, all departments should ultimately use the same categories. It can be suggested to divide the workforce into categories based on functions. There are currently over 600 different function descriptions within MST which makes it difficult and time consuming to divide the

personnel into manageable categories. MST is currently in the process of restructuring the functions and function groups. It is recommended to use the restructured function groups as categories into which the workforce is divided. It is important to choose these categories with care since this ultimately enables the organization to compare categories from different departments with each other.

8.2.1.3 Planning Horizon

Based on the findings of the interviews it is recommended to work with a planning horizon of three years. Due to the constantly changing and complex external environment team leaders and business managers believed it to be impossible to plan more than three years in advance. Since the external environment is uncertain and thus difficult to foresee, it is questionable whether it would be wise or beneficial to take a longer planning horizon than three years.

8.2.1.4 Time Frame

It can be recommended to carry out the complete SPP process once a year. When the instruments to forecast the supply of personnel in the future are linked to the personnel information system, this information is available at all times. Determining the future demand for personnel is likely to be a more time consuming matter. Therefore, it can be advised to run this process alongside the process of creating the annual plans, or even make SPP part of the process of developing the annual plans. Although the focus of the annual plans lies upon the upcoming year, whereas SPP aims to look at the next three years, both processes require the same information as input (i.e. the corporate strategy of MST) and require personnel to determine goals and future plans. These similarities make it to be most efficient to complete both processes simultaneously.

Since the SPP process is rather time consuming, performing it once a year should be sufficient. If, however, there are many changes in for example the external environment, it is possible to carry out the process more frequently. Overall, strategic personnel planning is a cyclical process that requires continuous analysis, feedback, evaluation, and adjustments.

8.2.1.5 Review

Finally, it is important to review the SPP system after the actual implementation. The SPP process should be reviewed after a year to evaluate the overall success of the SPP system and the accurateness of the prognoses that have been made (Evers & Verhoeven, 1999). Evaluation of the SPP system can result in alterations to the instruments or adding new instruments.

8.2.2 Prior to the Implementation of the SPP Framework within MST

Before the SPP framework developed in the current study can be implemented, some steps need to be taken to finalize the instruments and prepare the involved personnel for the implementation.

8.2.2.1 Software

All instruments used in the pilot implementation have been created in Excel. Although for the purpose of the pilot implementation these Excel documents were sufficient, more sophisticated Excel documents or software applications should be developed should MST wish to implement the instruments organization wide.

It is suggested to create a link between the personnel information system Beaufort and the SPP software (or Excel document). This allows for data regarding the current workforce to be accessed at any point in time without much effort.

It can be recommended that MST invites an expert to create a more workable Excel document. MST can also decide to ask an external organization to develop the necessary software. There are software programs for SPP available; one is currently being developed by the northern hospital. However, these complete packages do not offer much freedom to alter the program to the wishes and needs of the organization. Therefore, it is recommended that MST develops their own program or Excel document, possibly with the help of an external organization or expert, based on the instruments suggested in this report.

8.2.2.2 Beaufort

As previously mentioned, the data in Beaufort is not fully up-to-date. In order to create a realistic and accurate overview of the current workforce and the expected outflow it is important that the information extracted from Beaufort is correct and up-to-date. Cleansing the personnel information system is expected to be a time consuming process. However, it is recommended to do this prior to implementing SPP to enable the SPP process to be as efficient as possible.

8.2.2.3 Job Matrix

As mentioned in Section 8.2.1.2, MST is currently restructuring the functions and function groups. There are currently over 600 different functions within MST which can make it difficult to divide the workforce into manageable categories. The restructuring of the job matrix is meant to create generic functions and functiongroups which can make dividing the workforce into categories less complicated.

Besides, restructuring the functions is meant to improve the current performance assessment system by specifying criteria in terms of competencies and desired working behaviour, and clarify the internal mobility options of employees. Since these topics are closely related with SPP, it can be suggested to first complete the restructuring of the functions before starting strategic personnel planning.

8.2.2.4 Strategy

During the interviews with business managers and team leaders of MST it became clear that most respondents felt they lacked guidance in the form of an overall corporate strategy. Although the corporate strategy of MST is outdated, the organization is currently in the process of renewing the strategy. This new corporate strategy should help team leaders and business managers in developing strategic objectives for their departments.

Although there is currently no clear corporate strategy, there are corporate annual plans available from which team leaders and business managers make year plans for their departments. However, these annual plans only consider the upcoming years, making it difficult to focus on long-term (i.e. 3 to 5 years) goals and objectives.

Thus, once the organization has developed its corporate strategy, it can be used as a basis for setting the strategic objectives of the departments. This can be translated into the number and type of personnel necessary to reach these objectives.

8.2.2.5 Training & Manuals

It is recommended that all employees involved in the SPP process are trained on the subject. Especially the HR advisors who are responsible for coordinating the process and assisting the business managers and team leaders in using the instruments should be trained. It is important to make the purpose of the SPP process and the individual instruments clear to all people involved to assure that the information gathered is valuable which ultimately increases the reliability of the outcomes and thereby the benefits of SPP. Sinclair (2004) stresses the importance of proper training and mentions that HR personnel and managers responsible for the SPP process often lack some of the skills necessary to perform the process properly: they are “unaccustomed to thinking in the long-term” (p.12).

Since it would be nearly impossible to train all team leaders due to the large quantity of team leaders within MST, it is recommended to train only the HR advisors and the business managers in a face to face setting. This training can be provided by the HR policy department who is responsible for distributing the necessary instruments and centrally coordinating the SPP process.

In addition, a handbook with manuals should be created in which the workings of all instruments are explained. Such a handbook has been created for the pilot implementation (see Appendix D) and can be altered and distributed to the team leaders, business managers, and HR advisors. Besides the handbook, it is recommended to provide all people involved in the SPP process with the overview of the complete process. For this, Figure 8 can be used (perhaps it has to be translated into Dutch) which provides an overview of the workings of the instruments and the relationships between the different instruments. However, this figure alone does not provide enough information and must be used in combination with a handbook that describes the workings in detail. It can be suggested to print the figure on a poster and distribute this to the team leaders, business managers, and HR advisors.

8.2.2.6 Second Pilot Implementation

The final recommendation to be made regarding the process up to the actual implementation of the framework concerns a second pilot implementation. Since there are a number of items to create, complete, and/or communicate prior to the implementation, it is recommended to perform a second pilot implementation to fully test the SPP framework including the developed software, the updated personnel information system, the restructured job matrix, the corporate strategy, and the created manuals and offered trainings. It is suggested to include more than one department in the pilot implementation and focus on the workings of the instruments. If all above mentioned steps are completed successfully, there should not be any major problems during the second pilot implementation. However, the SPP framework or any aspect of the implementation might need to be adjusted before the SPP framework is implemented throughout the entire organization.

8.2.3 Implementing the SPP Framework within MST

After training the involved employees on the subject and creating workable tools for the SPP instruments, SPP can be implemented. The HR policy department starts the SPP process and distributes all necessary information. Next, the HR advisor, team leaders, and the business managers of a division perform the necessary steps to measure and portray the current workforce and make a prognosis of the supply of and demand for personnel in the future. With this information, the HR advisor creates the fit table after which the outcome is distributed to the HR policy department who determines what actions need to be taken to overcome any discrepancies that appeared in the fit table.

An overview of the interrelations between the different instruments has been represented in Figure 8 (see Section 8.1). Since the SPP process consists of different stages, Figure 9 presents the recommended sequence of steps.

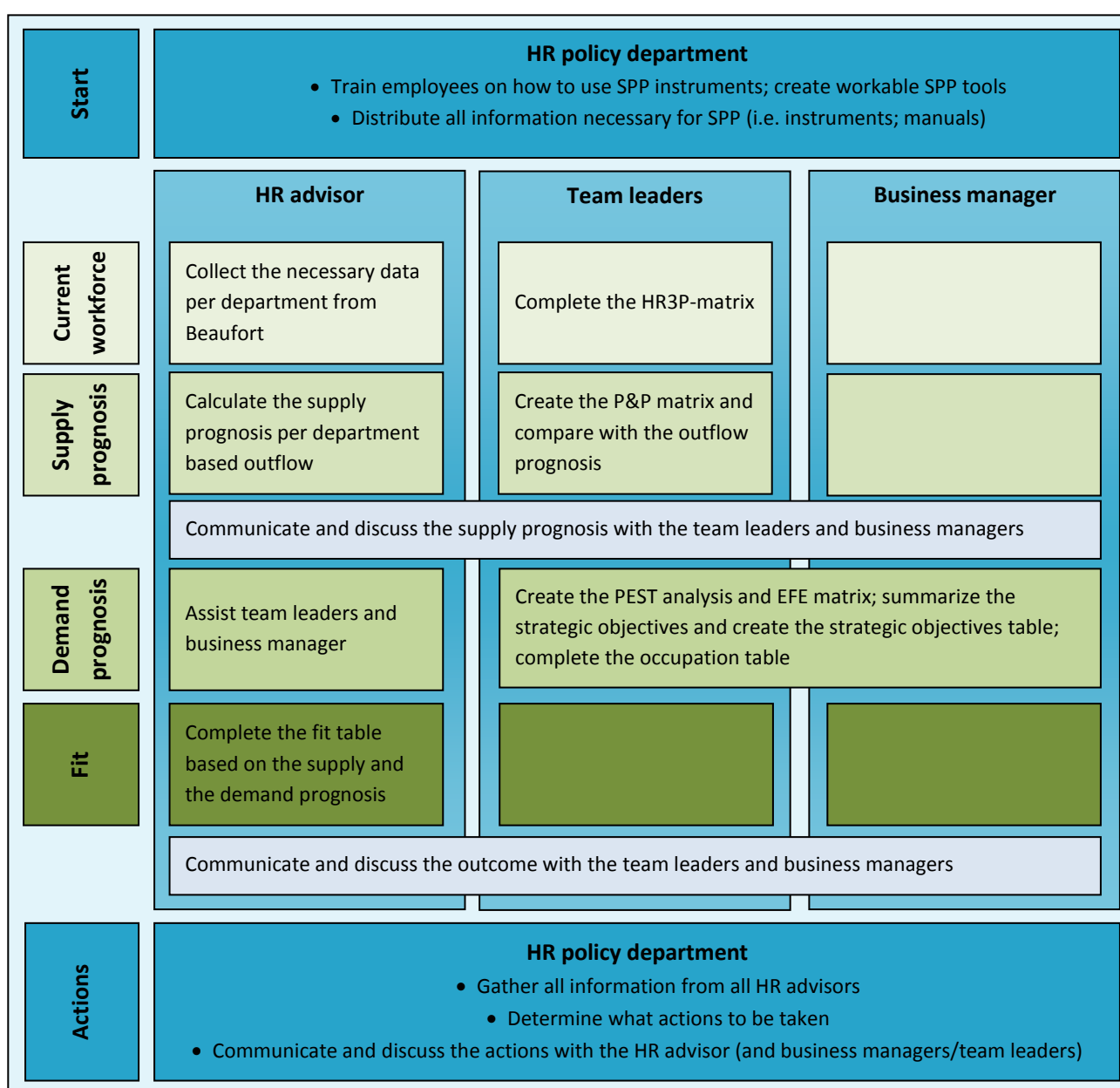


Figure 9 - SPP Implementation Process

As can be seen from Figure 9, the outcome of the supply prognosis as well as the overall outcome of the SPP process should be communicated and discussed with all parties involved. It is vital to communicate the supply prognosis since this can serve as an eye-opener by portraying the current state of the workforce and the changes that are likely to take place therein. Communicating and discussing the outcome of the SPP process (i.e. the fit) is important since this provides the team leaders and business managers to provide feedback regarding the outcome. Here, it can be discussed whether the outcome is realistic and whether actions need to be taken. It must be kept in mind that the outcome might be negative, meaning that a great shortage is expected. However, this is due to the fact that the supply prognosis merely displays how the current workforce transforms if nothing would change, thus it does not include inflow and assumes that no temporary contracts are being renewed. Since a large part of the outflow is likely to be caused by temporary contracts, a shortage can easily be overcome by extending some of these contracts. Inflow is not included in determining the future available personnel since inflow is seen as an outcome of the SPP process: SPP aims to determine the necessary quantity and quality of personnel that need to flow into the organization.

Overall, it must be kept in mind that the outcome of the SPP process is not necessarily exact; SPP involves estimating a future state, which cannot be done with complete accuracy. In addition, Sinclair (2004) argues that strategic personnel planning should be “seen as building a context for decision-making” (p.11) rather than predicting the future.

Finally, the HR policy department (or an employee from that department) is responsible for collecting all information and determining what actions can be taken. The outcome of the framework should be translated into human resource objectives and strategies needed to overcome the gap between the supply of and demand for personnel (Nkomo, 1988). To determine what actions are best suitable for each department, the before mentioned discussion and communication between the HR advisor, the team leaders, and the business manager of a division serves as a guideline. The HR policy department can determine whether organization wide actions are necessary, for example regarding internal flow between different departments/divisions; or whether the HR advisor can assist the business manager and team leaders in overcoming the gap on a departmental level.

8.2.4 Summary

Throughout the previous sections, several recommendations have been provided regarding the implementation of the SPP framework within MST. To provide a clear overview of these recommendations, the following list summarizes the points described above.

General remarks

- Central coordination, decentralized planning;
- Divide the workforce into categories based on functions;
- Use a planning horizon of 3 years;
- Perform the complete SPP process once a year, preferably combined with the process of developing the annual plans of the departments;
- Review the SPP process and the individual instruments after the implementation and alter the system if necessary.

Prior to implementing the SPP framework

- Develop workable software;
- Update Beaufort;
- Restructure the job matrix;
- Develop and communicate the corporate strategy;
- Train and educate the people involved in the SPP process;
- Second pilot implementation.

Implementing the SPP framework

- HR policy department starts the process;
- HR advisor, business manager, and team leaders collaborate;
- Communicate all findings with the people involved.
- HR policy department concludes the process.

9. DISCUSSION

Throughout this report, the SPP framework for MST has been developed. With the final outcome (i.e. the final SPP framework for MST) in mind, there are some issues to discuss. First of all, there are additional benefits to the SPP process and the individual instruments that are worth mentioning. Next, the practical limitations to the success of the SPP framework are described in Section 9.2. Recommendations with regard to future possibilities are discussed in Section 9.3. Finally, the research limitations of the current study are considered followed by the practical and theoretical relevance of the results.

9.1 Additional Benefits of SPP

The main value of the SPP process is that it provides the opportunity to determine the need for and the availability of personnel in order to timely signal any discrepancies and take the necessary actions to meet the changing demands and the objectives of the organization. Overall, the strategic personnel planning process aims at creating a foundation for decision-making.

The above mentioned aim is the central purpose of SPP. However, there are several other functions of the SPP process, and although they are not the core value of the process, they provide additional benefits that are worth mentioning. First, portraying the current workforce alone can serve as an eye-opener by highlighting focus areas and bottlenecks. In addition, the HR3P-matrix used to determine the performance and growth potential of the current workforce can be used as a instrument by itself; the HR3P-matrix and/or the P&P matrix can be used independent from the SPP framework for, for example, performance appraisal. Another important aspect is that SPP is not only useful in times when the labour market is scarce; SPP can be used during all sorts of reorganizations and organizational changes that impact the workforce of an organization. For example, SPP can help determine whether people need to be made redundant or whether the natural outflow alone is sufficient. Besides, SPP can help with the relocation of employees and internal mobility issues. When the SPP process has been completed for all departments within the organization (or within a division), all outcomes can be combined making it possible to compare the results. If, for example, there is a department where a shortage of nurses is expected, other departments can be searched where there is an overcapacity of nurses.

9.2 Practical Limitations to the Implementation

There are a number of steps that need to be completed prior to fully implementing the overall SPP framework. These have been described in Section 8.2.2. Some of these steps are important for the SPP process to succeed. Therefore, these limitations are addressed in the following paragraphs.

➤ **Update Beaufort**

Perhaps the most important aspect includes updating and correcting the personnel information system Beaufort. During the pilot implementation it was noticed that the information in Beaufort is not always accurate or correct. Since data from Beaufort forms the basis for determining the future supply of personnel, it is essential that this data is up-to-

date. In other words, when the information in Beaufort is not correct, the total outcome of the SPP process will be inaccurate.

➤ **Restructure the job matrix**

Although it is recommended to complete the restructuring of the job matrix prior to implementing the SPP framework, the framework can be implemented when the job matrix has not been restructured. The restructured job matrix should give more structure to the SPP process and provide the basis for dividing the workforce into categories. Although it would be a more complex situation, the SPP framework can be implemented without the use of the restructured job matrix. The disadvantage of this, however, is that the workforce would have to be redefined once the job matrix has been restructured.

➤ **Complete and communicate corporate strategy**

The corporate strategy is considered to be the basis from which each department creates their strategic objectives. Therefore, this process will be simpler when the corporate strategy is known. However, in case the corporate strategy is not completed and communicated, the departments can use the annual plans of the organization to create annual plans for their department, which can form the input for the SPP process. The difference between annual plans and strategic plans is that annual plans only focus on one year ahead whereas strategic plans aim to consider long term objectives. Since the planning horizon for SPP is three years, using the strategic plans is preferred over the annual plans.

Updating and correcting the personnel information system, restructuring the job matrix, and developing the corporate strategy are issues that are highly time consuming and can thus hold back the implementation of SPP. Therefore, it can be suggested to start by implementing the instruments of the SPP framework that do not require input from Beaufort or the corporate strategy. For example, the quality of the workforce can be analyzed to get a grip on the current situation. In addition, the PEST analysis and EFE matrix can be completed to assess the external environment.

It has been recommended to carry out a second pilot implementation after all steps recommended to perform prior to the implementation have been completed. This in order to fully test the SPP framework including the developed software, the updated personnel information system, the restructured job matrix, the corporate strategy, and the created manuals and offered trainings.

9.3 Future Recommendations

The SPP framework developed in the current study aimed at being suitable for MST within the current settings. However, this sometimes meant that certain instruments needed alterations because the data required as input was not available. In addition, there are some organizational changes taking place at the moment that can have an effect on the SPP framework and its instruments. These issues are described in detail below.

9.3.1 Internal Flow

The SPP framework developed for MST does not incorporate internal flow since the data regarding internal flow is unavailable. Although the team leaders and business managers interviewed argued

that there is hardly any flow between different departments, it can be suggested to include this through flow at a later point in time. This means that any internal flow would have to be monitored and registered more accurately. Once internal flow information has been accurately registered during the period of at least one year, it can be incorporated in the SPP framework. It can be suggested to incorporate internal flow by means of the IDU-matrix combined with the Markov model, as suggested in the preliminary SPP framework. This model can easily be added to the SPP framework: input for the matrix can be extracted from Beaufort; the calculations can be performed by a simple Excel document. By including internal flow in the SPP framework, a more complete picture can be created regarding the current workforce and its dynamics.

9.3.2 Employee Life Cycle

During the interviews team leaders mentioned that there is a relationship between the age of employees and the FTE of their function. It was mentioned that employees enter the workforce when they are approximately 25-30 years of age. After having worked full-time for a couple of years, employees generally start a family and work part-time to balance work with their social life. In addition, it is likely that employees resume working full-time when they are approximately 45-50 years old. Since SPP determines the FTE per function, it can be worthwhile to incorporate the before mentioned pattern in determining the personnel (FTE) available in the future.

This has not been incorporated in the current study since it is a complex matter and it is difficult to make assumptions regarding these types of trends. Should the organization wish to incorporate these and similar trends into the SPP system, additional research is necessary to determine the extent of the relationship and its effect on the supply of personnel. Similarly, there might be a relationship between the age of an employee and the length of time a person stays in a certain category. In other words, there can be a typical age an employee is promoted to another function. If this is the case, it can be suggested to consider the semi-Markov model, which uses conditional transition probabilities. This instrument has been excluded from the framework since it is currently not certain whether there is a direct relationship. However, should additional research prove that there is a relationship, it can be considered to include this in the SPP process. Although it might increase the accurateness of the supply prognosis, it must be kept in mind that these types of estimations should be performed by means of a computer program due to the complexity of the data and the calculations.

9.3.3 External Labour Market

The external labour market has not been included in the SPP framework developed in the current study. Only after determining the future supply of and demand for personnel, the external labour market becomes important. For example, an outcome of the SPP process could be that additional personnel is needed to overcome the gap between the personnel available and the personnel required in the future. In that case, the organization can first determine whether the additional personnel is available via the internal labour market. If this is not the case, the external labour market becomes important.

Thus, although monitoring the external labour market is not part of the SPP process, it can be necessary after completing the process. Therefore, it can be suggested to monitor the external labour market and the changes therein on a regular basis.

9.3.4 Staff Departments

The current study only considered clinical departments of the hospital. Staff departments have not been included in the study since the problem of this study concerned medical personnel (as specified in Section 1.4). However, it is likely that the SPP framework can also be implemented by staff departments, should the organization wish to include these departments in the SPP process. Prior to including these departments, it is recommended to perform a small scale implementation within one or two staff departments to test whether the instruments are appropriate to be used in that setting.

9.4 *Limitations to the Research*

There have been certain limitations to the current research that might have had an effect on the outcome of this study. The first limitation concerns the theoretical background; it can be noted that most of the instruments have been developed in the 1990s. It cannot be assumed that these instruments are still suitable to be used in today's dynamic environment. Although the information has been treated with care and several alterations have been made, there is an overall lack of recent research. However, strategic personnel planning gained much interest during the 1990s, hence all the instruments developed in that time. Since the late 1990s up to the mid 2000s, there was not much interest in SPP. As mentioned by Evers and Verhoeven (1999) and Cappelli (2009), strategic personnel planning becomes popular when the need for it is at its highest; then, after a few years, the interest in SPP gradually decreases. Due to the recent developments in the external environment and the expected shortages on the labour market, the interest in SPP has picked up since the late 2000s. However, it remains uncertain whether the use of more recent literature would have changed the outcome of the current research.

Secondly, the sampling technique of self-selection can be a threat to the internal reliability. It is possible that people only participated because they had a certain motive to participate in the study. For example because they feel the need for SPP is high within their department, or because they have an affinity with strategic personnel planning or strategic issues in general. This can have an effect on the instruments selected for the final SPP framework. However, it is difficult to determine the extent of the effect looking at the final selection of instruments.

Third, only eight team leaders and four business managers of four different divisions were interviewed. It can be argued whether eight team leaders out of a total of close to 100 team leaders form a representative sample. Due to time constraints it was not possible to include more team leaders in the sample. However, it is possible that the eight team leaders were not representative of the population which can have an effect on the outcome of the study.

The fourth and final limitation to the current research concerns the external validity: the results of the current study are difficult to generalize. The aim of this study was to develop a SPP framework for one specific organization: MST. Therefore, generalizing the results is of less importance. It might be possible to generalize the results and implement the SPP framework within another organization.

However, additional research is necessary to determine whether the SPP framework is truly suitable to be used in the setting of the organization or whether different instruments provide more accurate outcomes. In addition, further research could focus on determining to what extent the individual instruments are organization-specific or whether certain instruments can be altered slightly in order to be suitable for more organizations.

9.5 *Relevance of the Research*

The theoretical background showed that there are multiple possible instruments to measure or portray each of the different steps of the SPP process. Sinclair (2004) notes that the practicality and suitability of these approaches depends on “how easily they can be implemented and the ease with which they can be tailored to the situation at hand” (p.8) Thus, which instruments to use depends on the organization in which to implement the framework.

Although some researchers have suggested combinations of instruments to form a SPP framework, such as Evers and Verhoeven (1999), the overall framework developed for MST differs from these frameworks. Part of the instruments that form the strategic personnel planning framework developed in the current research are based on models and instruments developed by other researchers. Most of these instruments have been altered to fit the needs and requirements of MST. In addition, some instruments have been designed specifically for the purpose of the current study, thereby contributing to the body of knowledge by providing additional instruments. These instruments include: the P&P matrix; the total outflow overview; the strategic objectives table; the occupation table; and the fit table. Although most of these instruments are simply a table in which certain information is combined, they are valuable in providing a complete and practical overview. In addition, the instruments used in the current study are not all directly related to human resource planning. For example, the PEST analysis and the EFE matrix are instruments found in the area of strategy development and analysis. By adding these instruments to the SPP framework, the process covers a wider range of areas. Besides the relevance of the SPP framework itself, this research provides recommendations regarding the implementation of the SPP framework, which is relevant for researchers as well as practitioners interested in strategic personnel planning and the implementation thereof.

Overall, the results of the current study are difficult to generalize since the SPP framework was developed specifically for one organization. As previously noted, the type of instruments to use depends on the setting of the organization. However, the instruments that form the SPP framework developed in this study are not firm specific, or explicitly focussed on the health care sector, meaning that it can be possible for another organization to use the instruments. Should another organization wish to use the SPP framework developed in the current study, it is essential to determine whether the instruments are in fact suitable for that situation or whether different instruments provide more accurate outcomes.

REFERENCES

- Arbeidsmarkt Zorg en Welzijn (2011). *Arbeid in zorg en welzijn 2010* [Labour in Care and Welfare 2010]. Retrieved from <http://www.azwinfo.nl/index.cfm/1,87,370,0,html/?id=94>
- Babbie, E. (2010). *The practice of social research*. Wadsworth: Cengage Learning
- Beer, M., Spector, B., & Lawrence, P.R. (1984). *Managing human assets*. New York: The Free Press.
- Birch, S., Kephart, G., Tomblin Murphy, G., O'Brien-Pallas, L., Alder, R., & MacKenzie, A. (2009). Health human resources planning and the production of health: Development of an extended analytical framework for needs-based health human resource planning. *Journal of Public Health Management and Practice*, 15(6), S56-S61.
- Blank, J.L.T., & Wats, M.G. (2009). Aanbod ziekenhuiszorg in 2020 [supply hospital care in 2020]. *Tijdschrift voor Openbare Financiën*, 41(3), 141-157.
- Breeveld, R. (2011). *De missing link tussen performance- en competentie management* [The missing link between performance- and competency management]. Retrieved from <http://www.team-care.nl/wat-doen-wij/business-intelligence-support>
- Buchan, J. (1994). Nursing shortages and human resource planning. *International Journal of Nursing Studies*, 31(5), 460-470.
- Cappelli, P. (2009). A supply chain approach to workforce planning. *Organizational Dynamics*, 38(1), 8-15.
- David, F.R. (2007) *Strategic management: Concepts and cases*. Upper Saddle River, NJ: Pearson Prentice Hall.
- De Feyter, T. (2007). Modeling mixed push and pull promotion flows in manpower planning. *Annals of Operations Research*, 155(1), 25-39.
- Denton, F.T., Gafni, A., & Spencer, B.G. (1995). The SHARP way to play health care services: A description of the system and some illustrative applications in nursing human resource planning. *Socio-Economic Planning Sciences*, 29(2), 125-137.
- Dijkstra, J. (2008). *Handboek Human Resources Management* [Handbook Human Resources Management]. Assen, the Netherlands: Van Gorcum.
- Dreesch, N., Dolea, C., Dal Poz, M.R., Goubarev, A., Adams, O., Aregawi., ... Youssef-Fox, M. (2005). An approach to estimating human resource requirements to achieve the Millennium Development Goals. *Health Policy and Planning*, 20(5), 267-276.

- Edwards, J.S. (1983). A survey of manpower planning models and their application. *The Journal of the Operational Research Society*, 34(11), 1031-1040.
- Enzmann, D.R., Beauchamp, N.J., & Norbash, A. (2011). Scenario planning. *Journal of the American College of Radiology*, 8(3), 175-179.
- Evers, G.H.M., & Verhoeven, C.J. (1999). *Human resources planning: Een integrale benadering van personeelsplanning* [Human resources planning: An integral approach to personnel planning]. Deventer, the Netherlands: Kluwer/NVP.
- Garssen, J. (2011). Demografie van de vergrijzing [Demographics of the greying of the population]. *Bevolkingstrends*, 59(2), 15-27.
- Gass, S.I. (1991). Military manpower planning models. *Computers and Operations Research*, 18(1), 65-73.
- Geerlings, W.S.J., Verbraeck, A., Toussaint, P.J., & de Groot, R.P.T. (2001). Strategic human resource forecasting for an internal labour market. In R. Papp, *Strategic Information Technology: Opportunities for Competitive Advantage* (pp. 237-258). Hershey, PA: Idea Group Publishing.
- Geerlings, W.S.J., Verbraeck, A., de Groot, R.P.T., & Damen, G. (2001). Manpower forecasting: A discrete-event object-oriented simulation approach. *Proceedings of the 34th Hawaiian International Conference on Systems Sciences*, IEEE Computer Society Press, 1-9.
- Geurts, T.W., Evers, G.H.M., & Dekker, R.J.P. (1996). Human resource planning: A contingency approach (Working Paper No. 96.07.012). Retrieved from <http://arno.uvt.nl/show.cgi?fid=105566>
- Jackson, S.E., & Schuler, R.S. (1990). Human resource planning; Challenges for industrial/organizational psychologists. *American Psychologist*, 45(2), 223-239.
- Keenay, G.A., Morgan, R.W., & Ray, K.H. (1977). An analytical model for company manpower planning. *Operational Research Quarterly*, 28(4), 983-995.
- Khoong, C.M. (1996). An integrated system framework and analysis methodology for manpower planning. *International Journal of Manpower*, 17(1), 26-46.
- McClean, S. (1991). Manpower planning and their estimation. *European Journal of Operational Research*, 51(1), 179-187.
- Medisch Spectrum Twente (n.d.). Retrieved from <http://www.mst.nl/onzeorganisatie/>
- Medical School Twente (n.d.). Retrieved from <http://www.mst.nl/medischschooltwente/>
- Nederlandse Zorgautoriteit (2011). *Verantwoordingsdocument invoering prestatiebekostiging medisch specialistische zorg; Uitwerking van implementatie per 2012* [Document in support of the

introduction of performance based funding medical specialistic care; Elaboration of implementation by 2012]. Retrieved from <http://www.nza.nl/104107/138040/Verantwoordingsdocument-implementatie-prestatiebekostiging-medisch-specialistische-zorg.pdf>

Nkomo, S.M. (1988). Strategic planning for human resources – Let's get started. *Long Range Planning*, 21(1), 66-72.

NVZ Vereniging van Ziekenhuizen (2009). *Agenda 2015: Arbeidsmarktagenda voor de zorg* [Labour market agenda for healthcare]. Retrieved from <http://www.nvz-ziekenhuizen.nl/Werkgeverschap/Arbeidsmarkt/>

O'Brien-Pallas, L., Baumann, A., Donner, G., Tomblin Murphy, G., Lochhaas-Gerlach, J., & Luba, M. (2001). Forecasting models for human resources in health care. *Journal of Advanced Nursing*, 33(1), 120-129.

Pleijster, F., & Van der Valk, P. (2007). *Van onbemind tot onmisbaar. De economische betekenis van zpp'ers nu en in de toekomst* [From unpopular to indispensable. The economic meaning of ZZP'ers now and in the future]. Zoetermeer, the Netherlands: EIM.

Price, W.L., Martel, A., & Lewis, K.A. (1980) – A review of mathematical models in human resource planning. *The International Journal of Management Science*, 4(6), 639-645.

Purkiss, C. (1981). Corporate manpower planning: A review of models. *European Journal of Operational Research*, 8(1), 315-323.

Pynes, J.E., & Lombardi, D.N. (2011). *Human resource management for health care organizations: A strategic approach*. San Francisco: Jossey-Bass.

Reilly, P. (1996). *Human Resource Planning: An Introduction*. Poole: BEBC Distribution.

Reisman, A., Song, M.H., & Ikem, F. (1991). A taxonomy for manpower forecasting and planning. *Socio-Economic Planning Sciences*, 25(3), 221-231.

Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students*. Essex: Pearson Education Limited.

Sauter, W. (2010). *The role of competition rules in the context of healthcare reform in the Netherlands* (TILEC Discussion Paper Series, 2010-004). Retrieved from <http://ssrn.com/abstract=1546445>

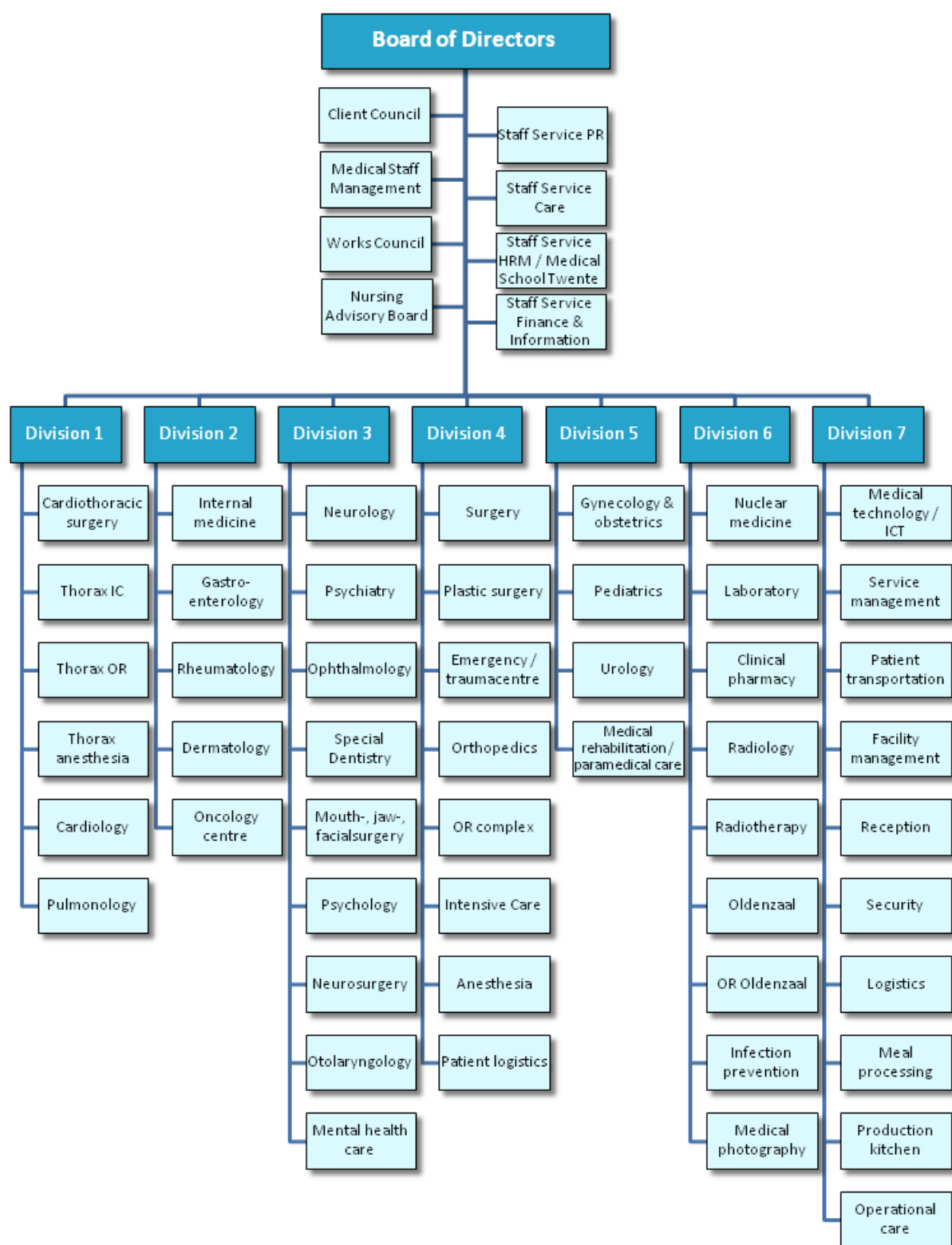
Schoemaker, P.J.H. (1995). Scenario planning: A tool for strategic thinking. *Sloan Management Review*, 36(2), 25-40.

- Schwartz, P. & Ogilvy, J. (1998). Plotting your scenarios. In L. Fahey & R. Randall, *Learning from the future* (pp. 57-80). Hoboken, NJ: John Wiley & Sons.
- Schwenker, B. & Bernardo, A. (2010). *Een andere instelling. Omgaan met veranderingen in de bekostiging van verpleging, verzorging, thuiszorg, gehandicaptenzorg en geestelijke gezondheidszorg* [A different position. Dealing with changes in the funding of nursing, care, home care, disabled care and mental care]. Hamburg, Germany: Roland Berger Strategy Consultants GmbH.
- Sinclair, A. (2004). *Workforce planning: A literature review*. Brighton: Institute for Employment Studies.
- Van Aken, J.E., Berends, H., & Van der Bij, H. (2007). *Problem solving in organizations: A methodological handbook for business students*. Cambridge, England: Cambridge University Press.
- Van der Windt, W., Smeets, R.C.K.H., & Arnold, E.J.E. (2009). *RegioMarge 2009: De arbeidsmarkt van verpleegkundigen, verzorgende en sociaalagogen 2009-2013* [RegioMarge 2009: The labour market of nurses, carers and sociologists]. Retrieved from <http://www.azwinfo.nl/index.cfm/1,87,370,0,html/?id=27>
- Van Duin, C., & Garssen J. (2010). Bevolkingsprognose 2010-2060: sterkere vergrijzing, langere levensduur [Population prognoses 2010-2060: strong greying, longer lifespan]. *Bevolkingstrends*, 59(1), 16-23.
- Verhoeven, K.J. (1981). Corporate manpower planning. *European Journal of Operational Research*, 7(1), 341-349.
- Venema, W.Z., & Wessels, J. (1988). Systematic modelling and model handling for manpower planning systems. *Decision Support Systems*, 4(1), 503-508.
- Verschuren, P., & Doorewaard, H. (2010). *Designing a research project*. The Hague, the Netherlands: Eleven International Publishing.
- VVD-CDA (2010). *Vrijheid en verantwoordelijkheid; Regeerakkoord VVD-CDA* [Freedom and responsibility; coalition agreement VVD-CDA].
- VVD-PvdA (2012). *Bruggen slaan; Regeerakkoord VVD-PvdA* [Building bridges; coalition agreement VVD-PvdA].
- Ward, S.C. (1987). How to computerize your personnel planning. *Long Range Planning*, 20(4), 88-101.
- Wessels, J. & Van Nunen, J.A.E.E. (1976). FORMASY FOrcasting and Recruitment in MAnpower SYstems. *Statistica Neerlandica*, 30(4), 173-193.

Zeffane, R., & Mayo, G. (1994). Planning for human resources in the 1990s: Development of an operational model. *International Journal of Manpower*, (15)6, 36-56.

Zorginnovatieplatform (2009). *Zorg voor mensen, mensen voor de zorg: Arbeidsmarktbeleid voor de zorgsector richting 2025* [Care for people, people for care: labour market policy for the care sector towards 2025]. Retrieved from <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2009/11/27/zorg-voor-mensen-mensen-voor-de-zorg.html>

APPENDIX A: ORGANIZATIONAL CHART



APPENDIX B: INTERVIEW PROTOCOLS STAKEHOLDERS

Invitation E-mail

The following invitation e-mail was first send to all business managers of MST. The business manager then appointed two team leaders who were send a similar e-mail. The RVE controller was contacted face-to-face; therefore, no e-mail was send.

Geachte heer/mevrouw,

Graag zou ik u uit willen nodigen een bijdrage te leveren aan mijn afstudeeronderzoek. Uw medewerking wordt zeer op prijs gesteld.

Ik zal mij eerst voorstellen: ik ben Marloes van der Worp en ik voer voor de stafdienst HRM van het MST een onderzoek uit naar strategische personeelsplanning en hoe dit binnen MST geïmplementeerd kan worden.

Strategische Personeelsplanning

Vele bronnen melden dat de zorgsector de komende jaren te kampen zal krijgen met een tekort aan personeel, wat onder andere veroorzaakt wordt door de vergrijzing en ontgroening van de bevolking. Naast een tekort aan personeel wordt ook een stijging in de vraag naar zorg verwacht. Strategische personeelsplanning biedt de handvatten om tijdig in te kunnen spelen op deze veranderingen, en hierop te anticiperen in plaats van te reageren.

Strategische personeelsplanning is het proces van het bepalen van de toekomstige vraag naar personeel en het toekomstige aanbod van personeel, om tijdig te kunnen inspelen op verschillen tussen de vraag en het aanbod in de toekomst en er voor te zorgen dat de juiste persoon op het juiste moment op de juiste plaats beschikbaar is.

Het doel van het onderzoek is het samenstellen van een strategisch personeelsplanning systeem, bestaande uit verschillende instrumenten om (1) het huidige personeelsbestand in kaart te brengen; (2) het toekomstige aanbod van personeel te berekenen; (3) de relevante externe factoren en strategische doelen te identificeren en in kaart te brengen; (4) de toekomstige vraag naar personeel te schatten; en (5) het verschil te berekenen tussen de vraag naar personeel en het aanbod van personeel in de toekomst.

Op basis van een literatuur onderzoek heb ik een strategisch personeelsplanning systeem voor MST samengesteld, bestaande uit verschillende instrumenten. De volgende stap is het beoordelen of deze instrumenten in de praktijk geschikt zijn voor MST.

Wat vraag ik van u

Graag nodig ik u uit om uw bijdrage te leveren aan dit onderzoek. Door middel van een interview hoop ik meer te weten te komen over uw wensen en behoeften, om zo een strategisch personeelsplanning systeem samen te stellen wat speciaal is ontwikkeld voor u.

De uitkomsten van de interviews zullen gebruikt worden om het strategische personeelsplanning systeem aan te passen aan de wensen van het MST. Het aangepaste strategische personeelsplanning systeem zal vervolgens getest worden door middel van een pilot implementatie. Tijdens deze pilot vraag ik een aantal personen om de instrumenten en modellen in de praktijk toe te passen en te testen op hun bruikbaarheid. Met uw feedback kan ik vervolgens de modellen en

instrumenten aanpassen en passende aanbevelingen doen met betrekking tot de uiteindelijke, MST brede, implementatie van het strategische personeelsplanning systeem.

Uw medewerking is van groot belang voor het succes van dit onderzoek en wordt dan ook zeer op prijs gesteld. Ik verzoek u vriendelijk mij te informeren of u mee wilt werken aan dit onderzoek. Vervolgens ontvangt u van mij een uitnodiging voor het interview. Het interview zal ongeveer een uur duren.

Indien u nog vragen of opmerkingen heeft met betrekking tot het onderzoek, de interviews of de pilot implementatie verzoek ik u contact met mij op te nemen via e-mail: m.vanderworp@mst.nl

Met vriendelijke groet,



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Interview Protocol RVE Controller

1. Wat voor personeels informatie systeem wordt momenteel gebruikt?
2. Waar wordt dit systeem hoofdzakelijk voor gebruikt?
3. Welke informatie is in dit systeem beschikbaar (functie/leeftijd/aantal jaar in dienst)?
4. Is informatie over de instroom, doorstroom, en uitstroom per afdeling beschikbaar? (IDU)
5. Zijn de relevante gegevens te sorteren op basis van de afdeling waarbinnen een werknemer werkzaam is?
6. Zijn de relevante gegevens uit dit systeem gemakkelijk te koppelen of te kopiëren naar een ander systeem of Excel bestand?
7. Tot welke informatie hebben individuele RVE toegang?
8. Hebben teamhoofden momenteel toegang tot dit systeem?
 - Nee → zou dit mogelijk zijn?

Interview Protocol Business Managers

ALGEMEEN

1. Bent u bekend met strategische personeelsplanning?
2. In hoeverre bent u bezig met het personeel wat u in de toekomst (3-5 jaar) nodig heeft en eventuele problemen die hierin kunnen ontstaan?
3. Gebruikt u hiervoor instrumenten of methodes?
4. Wie is er volgens u verantwoordelijk voor de uitvoering van de verschillende stappen van de strategische personeelsplanning?

HUIDIGE PERSONEELSBESTAND

5. Maakt u gebruik van een personeels informatie systeem? (naast het algemene systeem) Of is dit de verantwoordelijkheid van de teamhoofden?
 - Zo ja, wat voor systeem?
6. Welke informatie over uw huidige personeelsbestand (op uw afdeling(en)) heeft u beschikbaar?
7. Waar wordt deze informatie voor gebruikt?

8. Houdt u momenteel de mate van functioneren van uw medewerkers bij? (HR3P)

- Ja →
 - Op wat voor manier?
 - Hoe vaak beoordeelt u het functioneren van uw medewerkers?
 - Wat doet u met deze informatie?
- Nee → waarom niet / wanneer zou u dat wel doen?

9. Houdt u momenteel het doorgroei potentieel en mogelijkheden van uw medewerkers bij? (HR3P)

- Ja →
 - Op wat voor manier?
 - Hoe vaak beoordeelt u het doorgroei potentieel van uw medewerkers?
 - Wat doet u met deze informatie?
- Nee → waarom niet / wanneer zou u dat wel doen?

EXTERNE OMGEVING & STRATEGIE

10. Stelt u voor uw afdeling(-en) strategische plannen en doelstellingen op aan de hand van de strategische plannen van de organisatie?

- Ja →
 - Worden deze ook doorvertaald naar plannen en doelstellingen met betrekking tot het benodigde personeel voor de (individuele) afdelingen?
 - Ja → op wat voor manier?
 - Nee → Is dit wel mogelijk?
 - Wordt hierin ook rekening gehouden met de invloed van externe ontwikkelingen?
 - Ja → op wat voor manier?
 - Nee → waarom niet / wanneer zou u dat wel doen?
- Nee → waarom niet / wanneer zou u dat wel doen?

VRAAG NAAR PERSONEEL TOEKOMST

11. Hebt u momenteel een overzicht/idee van hoeveel mensen met welke kwaliteiten u nodig heeft in de toekomst (3-5 jaar)?

- Ja →
 - Hoe creëert u dit overzicht?
 - Waar is dit op gebaseerd?
 - Wat doet u met deze informatie?
- Nee → waarom niet / wanneer zou u dit wel doen?

12. Zou u, gebaseerd op de strategische doelstellingen van uw afdelingen en de invloed van externe factoren in staat zijn om een schatting te maken van het benodigde personeel in de toekomst?

- Nee → waarom niet? (Hebt u hier meer informatie voor nodig?)

CONCLUDEREND

13. Kijkend naar het SPP framework (preliminary), zijn volgens u alle aspecten hierin opgenomen welke belangrijk zijn voor het opstellen van een strategische personeelsplanning? Met andere woorden, zou u met de informatie verkregen met behulp van deze instrumenten een strategische personeelsplanning kunnen maken?
- Nee → Waarom niet?
14. Wat verwacht u van dit SPP systeem? Wat zou u er graag mee willen doen?
15. Denkt u dat een SPP systeem als deze u kan helpen? Hoe?
16. Hebt u nog overige opmerkingen, suggesties, of aandachtspunten met betrekking tot het (voorlopige) SPP framework?

Interview Protocol Team Leaders

ALGEMEEN

1. Hoe kijkt u aan tegen strategische personeelsplanning?
2. In hoeverre bent u bezig met het personeel wat u in de toekomst (3-5 jaar) nodig heeft en eventuele problemen die hierin kunnen ontstaan?
3. Gebruikt u hiervoor instrumenten of methodes?

HUIDIGE PERSONEELSBESTAND

4. Welke informatie over uw huidige personeelsbestand (op uw afdeling) heeft u beschikbaar?
5. Waar wordt deze informatie voor gebruikt?
6. Houdt u momenteel de mate van functioneren van uw medewerkers bij? (HR3P)
- Ja →
 - Op wat voor manier?
 - Hoe vaak beoordeelt u het functioneren van uw medewerkers?
 - Wat doet u met deze informatie?
 - Nee → waarom niet / wanneer zou u dat wel doen?
7. Houdt u momenteel het doorgroei potentieel van uw medewerkers bij? (HR3P)
- Ja →
 - Op wat voor manier?
 - Hoe vaak beoordeelt u het doorgroei potentieel van uw medewerkers?
 - Wat doet u met deze informatie?
 - Nee → waarom niet / wanneer zou u dat wel doen?

EXTERNE OMGEVING & STRATEGIE

8. Stelt u voor uw afdeling strategische plannen en doelstellingen op aan de hand van de strategische plannen van de organisatie?
- Ja →
 - Worden deze ook doorvertaald naar plannen en doelstellingen met betrekking tot het benodigde personeel voor uw afdeling?
 - Ja → op wat voor manier?
 - Nee → Is dit wel mogelijk?
 - Wordt hierin ook rekening gehouden met de invloed van externe factoren?
 - Ja → op wat voor manier?
 - Nee → waarom niet / wanneer zou u dat wel doen?
 - Nee → waarom niet / wanneer zou u dit wel doen?

VRAAG NAAR PERSONEEL TOEKOMST

9. Hebt u momenteel een overzicht/idee van hoeveel mensen met welke kwaliteiten u nodig heeft in de toekomst (3-5 jaar)?

- Ja →
 - Hoe creëert u dit overzicht?
 - Wat doet u met deze informatie?
- Nee → waarom niet / wanneer zou u dit wel doen?

10. Zou u, gebaseerd op de strategische doelstellingen van uw afdelingen en de invloed van externe factoren in staat zijn om een schatting te maken van het benodigde personeel in de toekomst?

- Nee → waarom niet? (Hebt u hier meer informatie voor nodig?)

CONCLUDEREND

11. Kijkend naar het SPP framework (preliminary), zijn volgens u alle aspecten hierin opgenomen welke belangrijk zijn voor het opstellen van een strategische personeelsplanning? Met andere woorden, zou u met de informatie verkregen met behulp van deze instrumenten een strategische personeelsplanning kunnen maken?

- Nee → Waarom niet?

12. Wat verwacht u van dit SPP systeem? Wat zou u er graag mee willen doen?

13. Denkt u dat een SPP systeem als deze u kan helpen? Hoe?

14. Hebt u nog overige opmerkingen, suggesties, of aandachtspunten met betrekking tot het (voorlopige) SPP framework?

APPENDIX C: INTERVIEW PROTOCOL SANTEON HOSPITALS

Invitation E-mail

Geachte heer/mevrouw,

Van de HR manager van Medisch Spectrum Twente (MST), kreeg ik uw contact gegevens.

Als afstudeeropdracht voor de opleiding Business Administration, met als specialisatie HRM, ben ik in opdracht van het MST een onderzoek aan het doen naar strategische personeelsplanning en hoe dit binnen het MST geïmplementeerd kan worden. Ik begreep van de HR manager van MST dat strategische personeelsplanning binnen <naam ziekenhuis> reeds geïmplementeerd is. Graag zou ik met u of één van uw collega's een interview afnemen omtrent strategische personeelsplanning en de implementatie hiervan binnen uw ziekenhuis.

Ik hoor graag van u of u mee wilt werken aan dit onderzoek. U kunt mij bereiken via e-mail: m.vanderworp@mst.nl

Met vriendelijke groet,



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Interview Protocol

1. Hoe lang is SPP bij uw ziekenhuis in gebruik?
2. Hoe ziet uw SPP systeem eruit en welke instrumenten worden er gebruikt?
3. Op welk niveau binnen de organisatie wordt SPP toegepast? (afdeling, RVE, hele bedrijf)
4. Wie is verantwoordelijk voor welk onderdeel/instrument van SPP?
5. Hoe wordt de input voor de instrumenten verzameld en verwerkt?
6. Wie is eindverantwoordelijk voor het SPP proces (centrale coördinator)?
7. Hoe is SPP geïmplementeerd? (In fases; hele bedrijf tegelijk; bepaalde afdelingen eerst; etc.)
8. Wat voor obstakels bent u tegen gekomen bij de implementatie van SPP?
 - Hoe bent u hiermee omgegaan?
9. Hoe vaak wordt SPP gestart (per jaar)?
10. Wanneer begint u met een SPP traject?
11. Hoelang duurt het gehele SPP proces?
12. Wat voor resultaten heeft SPP tot nu toe opgeleverd?
13. Wat wordt met deze resultaten gedaan?
 - Worden de resultaten centraal (door HRM) behandeld of is dit de verantwoordelijkheid van de afdelingen zelf?
14. Hebt u nog tips en/of advies voor de implementatie van SPP bij MST?

APPENDIX D: MANUALS PILOT IMPLEMENTATION

Huidige Kwantiteit

Gebruik voor het invullen het Excel document *Huidig Kwantiteit*

Tapblad 1 Personeelsbestand

Gegevens invullen m.b.t. het huidige personeelsbestand, per medewerker (naam; functie; geboortjaar; einddatum contract; aantal FTE). Wanneer een medewerker een contract voor onbepaalde tijd heeft kan de kolom einddatum contract leeg gelaten worden. Flexwerkers, uitzendkrachten, en andere soortgelijke medewerkers worden niet meegenomen in het overzicht, deze kunnen buiten beschouwing worden gelaten.

Gegevens huidig personeelsbestand

<u>Naam + Voorletter(s)</u>	<u>Functie</u>	<u>Geboortjaar</u>	<u>Einddatum contract</u> (jaar)	<u>FTE</u>

Tapblad 2 Uitstroom

Gegevens over de uitstroom van 2011 en, indien bekend, 2010 en 2009 invullen. Laat hier ook de flexwerkers en uitzendkrachten buiten beschouwing; ook vakantie krachten die slechts enkele weken werkzaam zijn geweest dienen niet meegenomen te worden in het overzicht.

Noteer voor ieder jaar afzonderlijk de functie van de medewerker die is uitgestroomd en de hoeveelheid FTE van deze medewerker. Het gaat om medewerkers die uit de afdeling stromen, het maakt daarvoor niet uit of ze doorstromen naar een andere afdeling of dat ze de organisatie verlaten. Natuurlijk verloop (dat wil zeggen: medewerkers die uitgestroomd zijn omdat zij een tijdelijk contract hadden wat niet verlengd werd of omdat een medewerker met pensioen is gegaan) wordt hierin niet meegenomen.

Gegevens uitstroom per medewerker

2011		2010		2009	
<u>Functie</u>	<u>FTE</u>	<u>Functie</u>	<u>FTE</u>	<u>Functie</u>	<u>FTE</u>

HR3P-matrix

Gebruik voor het invullen het Excel bestand *Huidig HR3P*.

De HR3P-matrix wordt ingevuld per categorie medewerkers. Voor iedere categorie wordt een nieuwe matrix gebruikt. Indien geen functiecategorieën beschikbaar zijn, deel dan zelf de functies in categorieën in waarbij de functies in één categorie enigszins met elkaar te vergelijken zijn.

Beoordeel per medewerker zijn/haar doorgroei potentieel en zijn/haar huidige performance. Vul de HR3P-matrix in door de namen (eventueel (personeels-)nummers i.p.v. namen) van de medewerkers in één van de 16 lichtblauwe vakken in te vullen, deze vakken zijn in de afbeelding hieronder met een rode rand aangegeven.

Nadat de HR3P-matrix volledig is ingevuld kunnen de kolomtotalen uitgerekend worden door de hoeveelheid medewerkers per kolom op te tellen, doe dit voor alle 4 de kolommen. De rijtotalen kunnen uitgerekend worden door de hoeveelheid medewerkers per rij op te tellen. De som van alle rijtotalen geeft de totale hoeveelheid medewerkers weer die in de HR3P-matrix zijn opgenomen. Dit getal is gelijk aan de som van alle kolomtotalen.

HR3P-matrix – kwaliteit huidige personeelsbestand

		Performance				Totaal
		Onvoldoende	Bevredigend	Goed	Excellent	
Potentieel	Heeft potentieel bereikt					
	Heeft groei potentie binnen huidige functie					
	Kan op korte termijn gepromoveerd worden					
	Kan nu gepromoveerd worden					
Totaal						Σ

Vraag naar Personeel

PEST analyse, EFE matrix, Strategische doelen, Scenario Planning en Occupation table

De vraag naar personeel (de personeelsbehoefte) schatten we voor de komende 3 jaar, dus t/m 2015.

Om een schatting te maken van het personeel dat we nodig denken te hebben over drie jaar kijken we naar de externe omgeving en de strategische plannen van de organisatie en de afdeling. Dit brengen we in kaart door middel van de instrumenten die hieronder beschreven staan. Gebruik voor het invullen van de modellen het Excel document Vraag naar personeel.

PEST Analyse

Gebruik voor het maken van de PEST analyse het 1e tapblad (PEST) van het Excel document Vraag naar personeel

PEST Analyse	
Politiek	
1.	
2.	
...	
Economie	
1.	
2.	
...	
Sociaal-cultureel	
1.	
2.	
...	
Technologie	
1.	
2.	
...	

Aan de hand van de PEST analyse kan de externe omgeving in kaart gebracht worden. Maak hiervoor een opsomming van de externe factoren met betrekking tot Politiek, Economie, Sociaal-cultureel, en Techniek. Focus op de factoren die invloed (kunnen) hebben op het personeelsbestand. Bijvoorbeeld een externe ontwikkeling waardoor meer of juist minder mensen nodig zullen zijn; of een ontwikkeling waardoor anders geschoolde mensen nodig zijn.

Factoren die nog onduidelijk zijn moeten hierin ook meegenomen worden. Dus ook externe ontwikkelingen die niet goed gespecificeerd kunnen worden of waarvan de invloed niet goed voorspeld kan worden dienen ingevuld te worden. Bijvoorbeeld bij technologische ontwikkelingen is het vaak onduidelijk wat voor effect deze hebben op het personeel of wanneer het effect merkbaar zal zijn.

External Factor Evaluation (EFE) Matrix

Gebruik voor het invullen van de EFE matrix het 2^e tapblad (EFE) van het Excel document *Vraag naar personeel*

EFE matrix				
Politiek		Weging	Waardering	Gewogen score
1.				
2.				
...				
Economie				
1.				
2.				
...				
Sociaal-cultureel				
1.				
2.				
...				
Technologie				
1.				
2.				
...				
Totaal		1,00		

Aan de hand van de externe factoren die gedefinieerd zijn in de PEST analyse (in tapblad 1) wordt de EFE matrix automatisch ingevuld.

Weging: weging van de factor. Stel de volgende vraag: hoeveel invloed zal deze factor hebben op het personeelsbestand? Weging tussen 0,0 (weinig invloed) tot 1,0 (zeer veel invloed). Het totaal van de wegingen moet precies 1,0 zijn.

Waardering: waardering van de huidige reactie van de afdeling op de externe factor, dus in hoeverre de afdeling nu is voorbereid op een factor. Voor elke factor wordt een score tussen de 1 en 4 gegeven.

- 1: de afdeling reageert uitstekend op de externe factor;
- 2: de afdeling reageert bovengemiddeld op de externe factor;
- 3: de afdeling reageert gemiddeld op de externe factor;
- 4: de afdeling reageert niet of nauwelijks op de externe factor.

Gewogen score: vermenigvuldig de waardering met de weging van de factor om de gewogen score te berekenen. **Totaal gewogen score:** de totale gewogen score ligt tussen de 1 en de 4 en geeft aan hoe de afdeling momenteel reageert op externe factoren.

Door de stappen hierboven te doorlopen ontstaat een overzicht van de externe factoren, de mate waarop deze van invloed zijn op het personeelsbestand van de afdeling, en waar aandachtsgebieden liggen. De weging geeft aan hoeveel invloed een externe factor kan hebben; de waardering geeft aan hoe er momenteel met de factor omgegaan wordt. Op deze manier kunnen aandachtspunten zichtbaar worden. Hoe hoger de gewogen score, hoe meer aandacht dat punt nodig heeft; want: hoe hoger de invloed van een factor en hoe lager de huidige reactie van de afdeling, hoe hoger de gewogen score.

Strategische Doelen

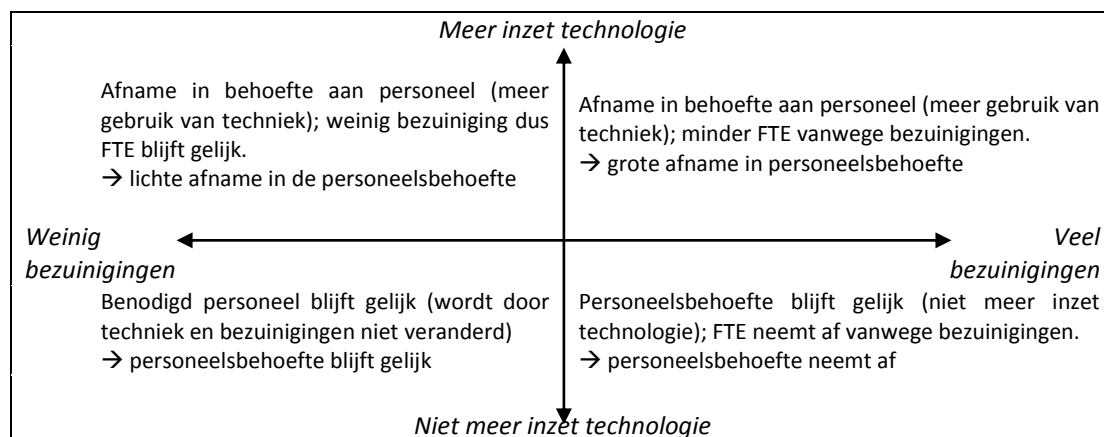
Gebruik voor het invullen van de strategische doelen het 3^e tapblad (*Strategie*) van het Excel document *Vraag naar personeel*

Strategie			
	Strategische doelen	Effect op personeel (meer/minder/anders)	Desbetreffende functie
1.			
2.			
3.			
...			

Maak in het Excel document een overzicht van de strategische doelen die invloed (kunnen) hebben op het personeelsbestand. Specificeer per punt welk effect het kan hebben: is er meer personeel voor een bepaalde functie nodig; is er ander personeel nodig; is er minder personeel nodig? Vul in de laatste kolom in om welke functie(s) het gaat.

Scenario Planning

Scenario planning kan gebruikt worden om de gezamenlijke invloed van de externe factoren en de strategische doelen te beoordelen door ze weer te geven in een scenario plot. In het voorbeeld hieronder is de externe factor *inzet technologie* en het strategische doel *bezuiniging* meegenomen. Met *inzet technologie* wordt hier bedoeld dat techniek, zoals bijvoorbeeld digitalisering, er voor zorgt dat minder mensen meer werk kunnen verrichten omdat technologische ontwikkelingen werkzaamheden van mensen over kunnen nemen. Met *bezuiniging* wordt bedoeld op kosten besparing wat kan resulteren in het afvloeien van FTE. Een scenario plot kan er dan als volgt uit zien:



Bovenstaande is slechts een voorbeeld. Uit de EFE matrix worden de belangrijkste externe factoren geselecteerd welke samen met de strategische doelen in een scenario plot verwerkt worden. Gebruik 2 factoren (1 externe en 1 strategische; of 2 externe; of 2 strategische) per scenario plot en maak, indien nodig, meerdere plots.

Deze scenario plots kunnen meer inzicht geven in de invloed die de factoren hebben op de personeelsbehoefte.

Toekomstige Bezetting - Occupation Table

Gebruik voor het invullen van de occupation table het 3^e tapblad (*Bezetting*) van het Excel document *Vraag naar personeel*

De laatste stap van het schatten van de vraag naar personeel in de toekomst (het benodigde personeel/de personeelsbehoefte) is het invullen van de occupation table. In deze tabel wordt simpelweg weergegeven wat de vraag naar personeel zal zijn, ten opzichte van de huidige bezetting. De uitkomsten van de hierboven beschreven modellen en instrumenten dienen gebruikt te worden om op basis daarvan conclusies te trekken en de vraag naar personeel te kwantificeren.

Geef per functiecategorie aan hoeveel FTE er meer of minder nodig is in de toekomst. Dit blijft natuurlijk een schatting welke gemaakt wordt op basis van de hierboven doorlopen stappen. Dus, op basis van de externe invloeden en de strategische doelen van de organisatie en de afdeling, hoeveel FTE is er binnen de afdeling meer of minder nodig voor een bepaalde functie?

Voorbeeld: het scenario plot voorbeeld geeft aan dat er een afname zal zijn in de personeelsbehoefte. Wanneer we bijvoorbeeld kijken naar secretaresses – volgens alle scenario's zal de personeelsbehoefte gelijk blijven of afnemen. Het is dus niet logisch dat er in de toekomst meer vraag naar secretaresses zal zijn. Bekijk vervolgens welke van de vier scenario's het meest waarschijnlijk is. Als bijvoorbeeld het scenario rechtsboven het meest waarschijnlijk is zal er dus een grote afname in secretaresses komen. Dit kan weergegeven worden in de occupation table door bij de desbetreffende functie een negatief getal in te vullen. Kijk hierbij naar de huidige hoeveelheid secretaresses. Is dit momenteel bijvoorbeeld 10 FTE, dan zou het kunnen zijn dat er in de toekomst 4 minder nodig zijn. In de occupation table vul je dan -4 in bij de functie categorie secretaresse.

Occupation Table	
Functie categorie	Toekomstige vraag (t.o.v. huidig; in FTE)
Categorie A	
Categorie B	
Categorie C	
Categorie D	
Categorie ...	
Totaal	

APPENDIX E: INTERVIEW PROTOCOL GROUP INTERVIEW

HUIDIGE PERSONEELSBESTAND

Kwantitatieve gegevens uit Beaufort

1. Wie heeft de informatie met betrekking tot de kwantitatieve bezetting verzameld?
2. Was deze informatie gemakkelijk uit Beaufort te halen?
3. Hoe veel tijd heeft het gekost?

HR3P-matrix

4. Wie heeft de HR3P-matrixen ingevuld?
5. Hoe is dit verlopen?
6. Hoeveel tijd heeft het gekost?
7. Hebt u op- of aanmerkingen met betrekking tot het invullen van de HR3P-matrix?

AANBOD PERSONEEL TOEKOMST

8. Wat vindt u van de uitkomst van de toekomst prognose op basis van de uitstroom?
9. Hebt u op- of aanmerkingen met betrekking tot de prognose?

EXTERNE OMGEVING & STRATEGIE

PEST analyse

10. Hoe is de PEST analyse tot stand gekomen?
11. Hebt u hiervoor gebruik gemaakt van een methode (bijvoorbeeld de EFTE-methode?)
12. Wie heeft de PEST analyse uitgevoerd?
13. Hoeveel tijd heeft het uitvoeren van de PEST analyse gekost?
14. Wat vindt u van de uitkomst van de PEST analyse?
15. Denkt u dat de PEST analyse een goed instrument is om de externe omgevingsfactoren in kaart te brengen?
16. Hebt u op- of aanmerkingen met betrekking tot de PEST analyse?

EFE matrix

17. Hoe is de EFE matrix tot stand gekomen?
18. Wie heeft de EFE matrix ingevuld?
19. Hoeveel tijd heeft het invullen van de EFE matrix gekost?
20. Wat vindt u van de uitkomst van de EFE matrix?
21. Denkt u dat de EFE matrix een goed instrument is om de mate van belangrijkheid van de omgevingsfactoren in kaart te brengen?
22. Hebt u op- of aanmerkingen met betrekking tot de EFE matrix?

Strategische doelen

23. Waren de strategische doelstellingen van de afdeling al bekend?
24. Hoe zijn de doelstellingen relevant voor SPP geselecteerd?
25. Wie is hierbij betrokken geweest?
26. Hoeveel tijd heeft dit gekost?
27. Hebt u op- of aanmerkingen met betrekking tot het in kaart brengen van de strategische doelen?

VRAAG NAAR PERSONEEL TOEKOMST

Scenario planning

- 28. Hoe zijn de verschillende scenario's tot stand gekomen?
- 29. Wie was betrokken bij dit proces?
- 30. Hoeveel tijd heeft het opstellen van scenario's gekost?
- 31. Wat vindt u van de uitkomst?

Occupation table

- 32. Hoe is de occupation table tot stand gekomen?
- 33. Hoe zijn de ontwikkelde scenario's hierin meegenomen?
- 34. Wie heeft de occupation table ingevuld?
- 35. Hoeveel tijd heeft het invullen van de occupation table gekost?
- 36. Wat vindt u van de uitkomst?
- 37. Hebt u op- of aanmerkingen met betrekking tot het invullen van de occupation table?

FIT

Fit table

- 38. Wat vindt u van de uitkomst zoals deze weergegeven wordt in de fit table?
- 39. Hebt u op- en of aanmerkingen met betrekking tot de fit table en de uitkomst hiervan?

ALGEMEEN

- 40. Wat zijn uw bevindingen over het algemeen?
- 41. Mist u iets in het gehele proces?
- 42. Wat vond u het moeilijkst?
- 43. Welk onderdeel kostte de meeste tijd?
- 44. Wat moet er volgens u aangepast/verandert worden?